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NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

**ADDING A PERFORMANCE-BASED COMPONENT
TO SURFACE WARFARE OFFICER BONUSES:
WILL IT AFFECT RETENTION?**

by

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March 2008

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**ADDING A PERFORMANCE-BASED COMPONENT
TO SURFACE WARFARE OFFICER BONUSES:
WILL IT AFFECT RETENTION?**

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ABSTRACT

The Surface Warfare Officer (SWO) community has difficulty retaining mid-grade officers, as is evident by the considerable shortfall between Officer Programmed Authorization and the current officer inventory beginning at 9 years of commissioned service. The objective of this study was to analyze the 13-year retention effect of adding a performance-based component to the SWO Critical Skills Bonus (CSB). By analyzing pay and personnel records from officer cohorts entering the Navy between 1987 and 2006, this study divided the sample of 1,331 SWOs into three performance tiers based on promotion timing to Lieutenant Commander (O-4). Probit regressions showed that top performers exhibited higher retention rates than lower-performing peers, though pay had a stronger retention effect among low performers. Additionally, the Commander (O-5) promotion rate for high performers was triple the promotion rate of lower performers. Expanding upon performance-tier differences, optimization models predicted a more efficient SWO CSB allocation while retaining the highest performers and remaining within budgetary constraints. Thus, research recommends adding a performance-based component to the SWO CSB, which will maximize retention of high-performing officers. Furthermore, the Navy can realize additional savings by adopting cafeteria-style bonus options, capitalizing on differences between the federal standard discount rate and personal discount rates.

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TABLE OF CONTENTS

I.	INTRODUCTION.....	1
A.	BACKGROUND	1
B.	OBJECTIVES	4
C.	RESEARCH QUESTIONS	4
D.	HYPOTHESIS.....	5
E.	RESEARCH METHODOLOGY	5
F.	BENEFITS.....	6
G.	SCOPE LIMITATIONS.....	6
H.	ORGANIZATION	7
II.	SURFACE WARFARE OFFICER RETENTION	9
A.	OVERVIEW	9
B.	MILITARY AS AN INTERNAL LABOR MARKET	9
1.	Recruiting and Retention	9
2.	Promotion	11
3.	Pay Structure.....	15
C.	THE SURFACE WARFARE OFFICER CAREER PATH.....	17
1.	From Accession through the First Department Head Tour.....	18
2.	Second Department Head Tour through Executive Officer (XO) Tour	20
3.	Commanding Officer (CO) Tour through Major Command	21
4.	Individual Augmentation (IA) and Global War on Terrorism Support Assignments (GSA) during Shore Duty	22
D.	RETENTION ISSUES AMONG SURFACE WARFARE OFFICERS ...	23
1.	SWO Retention.....	23
2.	Differences in SWO Retention by Gender	27
3.	Lateral Transfer to Other Officer Communities	30
4.	Retention of “High-Quality” Surface Warfare Officers	31
a.	Defining Quality Performance	32
b.	Definition of Quality Changes with Rank.....	34
5.	Dissatisfaction with Compensation as a Reason for Leaving.....	35
a.	2000 Military Exit Survey	36
b.	2004 SWO Continuation Intentions Quick Poll	36
c.	2005 SWO Junior Officer Survey.....	37
d.	August 2005 Status of Forces Survey of Active-Duty Members	39
e.	Other SWO Retention Surveys	41
f.	Weaknesses of Survey Data	43
g.	Analysis of Factors Affecting the Retention Plans of Junior Navy Officers.....	44
6.	Annualized Cost of Leaving (ACOL) Model	44
a.	Methodology of the ACOL Model	44

	<i>b. ACOL Model for Surface Warfare Officers.....</i>	<i>46</i>
E.	FACTORS INFLUENCING RETENTION.....	47
	1. Human Capital.....	47
	2. Human Motivation.....	50
	3. Intrinsic and Extrinsic Rewards: What Motivates Surface Warfare Officers?	52
F.	CHAPTER SUMMARY.....	54
III.	CURRENT POLICIES AND LEGISLATION AFFECTING SURFACE WARFARE OFFICERS' PAY, PERFORMANCE EVALUATION, AND PROMOTION.....	57
	A. OVERVIEW.....	57
	B. MILITARY PAY SYSTEM.....	57
	1. Cash Payments	58
	<i>a. Basic Pay and Allowances</i>	<i>58</i>
	<i>b. Special and Incentive Pays: Surface Warfare Officer Bonuses.....</i>	<i>59</i>
	<i>c. Effect of SWO Incentive Pays on Retention</i>	<i>64</i>
	<i>d. Annual Adjustments and Tax Advantages.....</i>	<i>65</i>
	2. In-kind Benefits (Health Care)	66
	3. Deferred Benefits (Retirement)	68
	C. LEGISLATIVE PROCESS FOR MILITARY COMPENSATION	70
	D. SURFACE WARFARE OFFICER PERFORMANCE EVALUATION SYSTEM.....	72
	1. Contents of a FITREP	72
	2. Grade Inflation.....	74
	E. SURFACE WARFARE OFFICER PROMOTIONS	75
	1. Promotion Zones and Promotion Timing.....	76
	2. Promotion as a Measure of Performance	79
	3. Potential Bias in Promotion Boards	81
	F. CHAPTER SUMMARY.....	82
IV.	PERFORMANCE AND COMPENSATION THEORY.....	85
	A. OVERVIEW.....	85
	B. LABOR ECONOMIC THEORY	85
	1. Human Capital Theory.....	86
	2. Wage Theories.....	91
	<i>a. Efficiency Wage Theory.....</i>	<i>91</i>
	<i>b. Performance-based Compensation as an Incentive</i>	<i>94</i>
	3. Tournament Theory.....	95
	<i>a. Promotion Tournaments.....</i>	<i>95</i>
	<i>b. Risk Taking in Tournaments.....</i>	<i>100</i>
	<i>c. Weaknesses of Promotion Tournaments.....</i>	<i>101</i>
	4. Employee Performance, Turnover, and Pay Relationships	103
	<i>a. "Curvilinear" Relationship in a Civilian Firm.....</i>	<i>103</i>
	<i>b. U.S. Department of Defense Government Employees</i>	<i>107</i>
	<i>c. Theoretical Utility Analysis</i>	<i>109</i>

C.	ORGANIZATIONAL BEHAVIOR	112
1.	Maslow's Needs Hierarchy Theory	113
2.	Behavioral Reinforcement Theory	115
3.	Agency Theory	117
4.	Herzberg's Motivation-Hygiene Theory	119
5.	Management Philosophy Theories	120
a.	<i>Theory X and Theory Y</i>	121
b.	<i>Theory Z</i>	122
c.	<i>Peter Principle</i>	122
d.	<i>Theory A</i>	123
6.	Expectancy Theory	124
7.	Equity Theory	127
D.	CHAPTER SUMMARY	129
V.	PERFORMANCE-BASED COMPENSATION IN PRACTICE	131
A.	OVERVIEW	131
B.	IMPLEMENTING PERFORMANCE-BASED COMPENSATION	131
1.	Annual Salary Increases	137
2.	Performance Bonuses	138
3.	Miscellaneous Rewards	139
C.	GOVERNMENT DEMONSTRATION PROJECTS	139
D.	PERFORMANCE-BASED COMPENSATION COMPARISON STUDY	142
1.	Performance Management and Recognition System (PMRS)	142
2.	China Lake	144
3.	Summary	145
E.	DEPARTMENT OF HOMELAND SECURITY AND NATIONAL SECURITY PERSONNEL SYSTEM PERFORMANCE-BASED COMPENSATION SYSTEMS	149
1.	Department of Homeland Security (DHS)	149
2.	National Security Personnel System (NSPS)	151
a.	<i>Performance Management</i>	154
b.	<i>Performance-based Compensation Component</i>	155
c.	<i>NSPS Payout</i>	156
F.	PRIVATE-SECTOR PERFORMANCE-BASED COMPENSATION	157
1.	Successful Implementation	158
2.	Failed Implementation	160
G.	PROBLEMS IMPLEMENTING PERFORMANCE-BASED COMPENSATION	163
H.	CHAPTER SUMMARY	167
VI.	MODELING THE RETENTION EFFECT OF ADDING A PERFORMANCE-BASED COMPONENT TO THE SWO CRITICAL SKILLS BONUS	169
A.	OVERVIEW	169
B.	DATASET AND SAMPLE	170
1.	DMDC Dataset	170

	2.	Surface Warfare Officer Sample.....	170
C.		DESCRIPTION OF VARIABLES.....	171
	1.	Dependent Variables.....	171
	a.	13-year Retention.....	171
	b.	Performance Tiers.....	172
	2.	Independent Variables.....	173
	a.	Accession Age.....	173
	b.	Marital Status and Number of Dependents Variables.....	173
	c.	Prior-enlisted Experience.....	173
	d.	Gender.....	174
	e.	Race and Ethnicity Variables.....	174
	f.	Education Variables.....	175
	g.	Joint Professional Military Education (JPME).....	176
	h.	Commissioning Source Variables.....	176
	i.	Command Status.....	177
	j.	Cash Compensation.....	178
D.		METHODOLOGY.....	179
	1.	Econometric Models.....	180
	a.	Model for 13-year Retention.....	181
	b.	Models for Tier Characteristics.....	182
	c.	Models for Pay Elasticity.....	182
	2.	Optimization Models.....	183
	a.	Present Value of the SWO Critical Skills Bonus.....	184
	b.	Maximizing 13-year Retention.....	184
	c.	Maximizing the Retention Bonus Differential between Performance Tiers.....	187
E.		HYPOTHESIZED EFFECTS OF EXPLANATORY VARIABLES.....	187
	1.	“Curvilinear” Relationship between Performance and Retention.....	188
	2.	Effect of Quality Variables on Performance Tiers.....	188
	3.	Pay Elasticity Differences between Performance Tiers.....	189
F.		DESCRIPTIVE STATISTICS.....	189
	1.	Performance-tiered SWO Sample.....	189
	2.	Characteristics of Each Performance Tier.....	191
	a.	Master’s Degree.....	198
	b.	Post-Master’s Degree.....	199
	c.	JPME Phase I.....	199
	d.	JPME Phase II.....	199
	e.	Command Status.....	199
	3.	Gender Differences.....	200
	4.	Surface Warfare Officer Cash Compensation.....	203
G.		ECONOMETRIC MODEL RESULTS.....	207
	1.	13-year Retention Models.....	207
	2.	Tier Characteristics Models.....	211
	a.	Tier-1 Characteristics.....	211

	b.	Tier-2 Characteristics	213
	c.	Tier-3 Characteristics	215
	3.	Pay Elasticity Models.....	217
H.		OPTIMIZATION MODEL RESULTS	218
	1.	Theoretical Current Situation	218
	2.	Maximizing 13-year Retention and Maximizing the Retention Bonus Differential (between Performance Tiers) Models.....	220
	3.	Cost-benefit Analysis of Increasing SWO Retention beyond the Optimal Solution	223
	4.	Cafeteria-style Retention Bonus Options.....	224
I.		MODEL LIMITATIONS.....	229
	1.	Performance Tier Categories.....	229
	2.	Econometric Models	230
	3.	Optimization Models	231
J.		CHAPTER SUMMARY.....	231
VII.		SUMMARY, RECOMMENDATIONS AND CONCLUSIONS	233
	A.	SUMMARY	233
	B.	IMPLEMENTING A PERFORMANCE-BASED COMPONENT OF THE SURFACE WARFARE OFFICER CRITICAL SKILLS BONUS.....	234
	1.	Legislative, Policy, and Procedural Implications.....	234
	2.	Program Implementation.....	237
	3.	Predicted Cultural Resistance to Change	238
	4.	Spillover Effects	242
	a.	Positive Spillover Effects	242
	b.	Negative Spillover Effects.....	244
	C.	CONCLUSIONS	245
	D.	RECOMMENDATIONS.....	247
	1.	Adding a Performance-based Component to the SWO Critical Skills Bonus	247
	2.	Cafeteria-style Payment Program	248
	3.	Recommendations for Further Research.....	248
	a.	Analysis at Earlier Ports of Exit in the Junior SWO Ranks	248
	b.	Cultural Climate Analysis of the Surface Warfare Community	249
		APPENDIX A. FY 2008 MONTHLY BASIC PAY TABLE.....	251
		APPENDIX B. NAVAL OFFICER FITREP (NAVPERS 1610/2).....	253
		APPENDIX C. PAY ELASTICITY REGRESSION MODELS FOR TIER-1 PERFORMERS.....	255
		APPENDIX D. PAY ELASTICITY REGRESSION MODELS FOR TIER-2 PERFORMERS.....	257

APPENDIX E. PAY ELASTICITY REGRESSION MODELS FOR TIER-3 PERFORMERS.....	259
APPENDIX F. 13-YEAR RETENTION OPTIMIZATION MODEL.....	261
APPENDIX G. BONUS DIFFERENTIAL OPTIMIZATION MODEL.....	263
LIST OF REFERENCES.....	265
INITIAL DISTRIBUTION LIST	281

LIST OF FIGURES

Figure 1.	Inverse Relationship between Officer Inventory and the Value of Officers to the Navy.....	12
Figure 2.	SWO Career Path from Accession through the First Department Head Tour (Commander Naval Surface Forces, 2008b, p. 4).....	18
Figure 3.	SWO Qualifications during the First Division Officer Tour (Commander Naval Surface Forces, 2008a, p. 5).....	19
Figure 4.	SWO Career Path from the Second Department Head Tour through XO (Commander Naval Surface Forces, 2008b, p. 20).....	20
Figure 5.	SWO Career Path from CO through Major Command (Commander Naval Surface Forces, 2008b, p. 32).....	21
Figure 6.	Snapshot of Surface Warfare Officers filling IA and GSA Billets (Commander Naval Surface Forces, 2008b, p. 13).....	23
Figure 7.	Overall Retention Rates for Navy Commissioned Officers by Commissioning Program for Selected Fiscal Years at Key Ports of Exit (GAO, 2007b, p. 33).....	24
Figure 8.	SWO Community Standardized FY08 Inventory (Adapted from Commander Naval Surface Forces, 2008b, p. 3).....	25
Figure 9.	SWO Community February 2001 Inventory Plotted against FY00 OPA (Crayton, Darling & Mackin, 2002, p. 4).....	26
Figure 10.	Gender Differences in SWO Retention by Year Group (Adapted from Commander Naval Surface Forces, 2008b, p. 17).....	28
Figure 11.	Lateral Transfers by Unrestricted Line Officer Community (Monroe & Cymrot, 2004, p. 7).....	31
Figure 12.	Surface Warfare Officer Qualifications and Education Statistics (Adapted from Commander Navy Personnel Command, 2007a, pp. 3-5).....	35
Figure 13.	Level of Motivation that SWOCP Provides to the Retention Decision among SWOs (US Department of the Navy, n.d., p.15).....	38
Figure 14.	Level of Motivation that Junior SWO CSRB Provides to the Retention Decision among SWOs (US Department of the Navy, n.d., p.15).....	38
Figure 15.	Satisfaction Aspects of Military Service for all Service Members (DMDC, 2006, p. 39).....	40
Figure 16.	Comparison of Military to Civilian Opportunities (DMDC, 2006, p. 337)....	40
Figure 17.	Importance of Factors in Improving Work-life Balance (DMDC, 2006, p. 358).....	41
Figure 18.	Effect of SWOCP on SWO Retention for YG94 through YG97 (Crawford et al., 2006, p. 28).....	43
Figure 19.	FILM and Organization Commitment by Levels of Job Security (Yang, Worden & Wilson, 2004, p. 680).....	53
Figure 20.	FILM and Organization Commitment by Levels of Promotion Opportunities (Yang et al., 2004, p. 681).....	54
Figure 21.	Officer Loss Distribution (DACMC, 2006, p.19).....	70

Figure 22.	Mean Salary Over Time for the Sample Firm Compared to the Industry Standard (Baker et al., 1994b)	93
Figure 23.	Curvilinear Relationship of Survival Probability and Average Performance Rating by Tenure as Measured in Years from Initial Hire (Trevor et al., 1997, p. 52)	104
Figure 24.	Curvilinear Relationship of Survival Probability and Average Performance Rating by Level of Salary Growth (Trevor et al., 1997, p. 57).....	105
Figure 25.	Flow Chart of Utility Analysis Methodology (Sturman et al., 2003, p. 1002)	110
Figure 26.	Maslow's Needs Hierarchy (Adapted from McShane & Von Glinow, 2007, p. 93)	114
Figure 27.	Expectancy Theory of Motivation (Adapted from McShane & Von Glinow, 2007, p. 96)	125
Figure 28.	Issues for Managers to Address Using Expectancy Theory on Followers (Isaac et al., 2001, p. 221).....	126
Figure 29.	Changing Organizational Culture with Pay for Performance (MSPB, 2006, p. 4)	135
Figure 30.	Median Salary by Grade, General Schedule Scientists and Engineers (Gibbs, 2006, p. 203)	147
Figure 31.	Median Salary by Level of Responsibility, Private-sector Engineers (Gibbs, 2006, p. 203)	148
Figure 32.	DoD NSPS Standard Career Group Pay Plan (NSPS, 2008a, p. 1).....	153
Figure 33.	2008 GS Salary Table (OPM, 2008, p. 1).....	154
Figure 34.	Performance Management Lifecycle (Adapted from NSPS, 2008b).....	155
Figure 35.	Effect of Performance Tier on 13-year Retention Based on Descriptive Statistics	196
Figure 36.	Effect of Performance Tier on 13-year Retention—Comparison of Descriptive Statistics and Regression Results	209
Figure 37.	Comparison of Excess Cost by the Number of SWOs Retained	224
Figure 38.	Stages of the Change Process (Adapted from SHRM, 2007b, p. 3-38).....	240
Figure 39.	Lewin's Force Field Analysis (Adapted from McShane & Von Glinow, 2007, p. 272)	241
Figure 40.	Annual Basic Pay by Years of Commissioned Service (Adapted from Under Secretary of Defense for Personnel and Readiness, 2008a, p. 1)	243

LIST OF TABLES

Table 1.	ROI Model Results for Each Proposed Sabbatical Leave Program (Yardley et al., 2004, p. 26)	29
Table 2.	Pay Elasticity of SWO Retention Decisions at Critical Ports of Exit (Adapted from Crayton et al., 2002, pp. 9-14).....	46
Table 3.	Description of the Four SWO Retention Bonuses (Adapted from Chief of Naval Operations, 2002; Chief of Naval Operations, 2004a; Chief of Naval Operations, 2005b; Commander Naval Surface Forces, 2008b; Navy Personnel Command, 2008a; Navy Personnel Command, 2008b)	61
Table 4.	TRICARE Benefit Summary for Beneficiaries under Age 65 (DACMC, 2006, p. 74)	67
Table 5.	Maximum Limits on “Early Promote” and “Must Promote” Recommendations (Adapted from Bureau of Naval Personnel, 2005, p. 1-19)	74
Table 6.	Promotion Timing and Promotion Opportunities (Adapted from Yardley et al., 2005, pp. 12-13)	77
Table 7.	SWO Promotion Rates to Lieutenant Commander (O-4) for FY03 through FY08 (Adapted from Commander Navy Personnel Command, 2008a).....	78
Table 8.	SWO Promotion Rates to Commander (O-5) for FY03 through FY08 (Adapted from Commander Navy Personnel Command, 2008a).....	78
Table 9.	SWO Promotion Rates to Captain (O-6) for FY03 through FY08 (Adapted from Commander Navy Personnel Command, 2008a).....	79
Table 10.	Effects of Human Capital and Hierarchical Level on Current Salary (Baker et al., 1994a, p. 907).....	90
Table 11.	Regression Results of the Natural Log of Compensation on Hierarchical Level and Individual Characteristics, with and without Firm and Individual Fixed Effects (Bognanno, 2001, p. 295).....	98
Table 12.	Proportional Hazard Regressions of Voluntary Turnover on Average Annual Salary Growth and Average Annual Promotions, for Each Average Performance Category (Trevor et al., 1997, p. 56)	106
Table 13.	Linear Probability Models Predicting Employee Exits (Gibbs, 2006, p. 212)	108
Table 14.	Utility Analysis Results of Different Pay Strategies at Three Different Deviation Categories (Sturman et al., 2003, p. 1026).....	111
Table 15.	Trends in Returns to Unobserved Skills in GS, PMRS, and China Lake Pay Plans between 1982-1996 (Adapted from Gibbs, 2006).....	145
Table 16.	Salary Premiums Associated with Performance Ratings, and Frequency Distribution of Performance Ratings, for Managers in Two Large Manufacturing Firms (Baker et al., 1988, p. 595, as adapted from Medoff & Abraham, 1980)	165
Table 17.	Definition of Performance Categories	172
Table 18.	Description of Gender Variables	174
Table 19.	Description of Race and Ethnicity Variables.....	175

Table 20.	Description of Education-level Variables	176
Table 21.	Description of Joint Professional Military Education (JPME) Variables	176
Table 22.	Description of Commissioning Source Variables	177
Table 23.	Description of Cash Compensation (Pay) Variables	179
Table 24.	Present Value (PV) Calculation for the 3-year Obligation Option of the SWO Critical Skills Bonus	184
Table 25.	13-year Retention Optimization Model Constraints and Definitions	185
Table 26.	Descriptive Statistics for the Performance-tiered SWO Sample	190
Table 27.	Descriptive Statistics for Time to Promote to O-4 by Performance Tier	191
Table 28.	Descriptive Statistics for Tier-1 Performers	192
Table 29.	Descriptive Statistics for Tier-2 Performers	193
Table 30.	Descriptive Statistics for Tier-3 Performers	194
Table 31.	T-test for Tier Differences in Group Means for Quality Characteristics	197
Table 32.	Descriptive Statistics for Male SWOs	201
Table 33.	Descriptive Statistics for Female SWOs	202
Table 34.	T-test for Gender Difference in Group Means for 13-year Retention	203
Table 35.	Descriptive Statistics of Pay by Calendar Year for SWO Sample	204
Table 36.	13-year Retention Regression Models	208
Table 37.	Tier-1 Characteristics Regression Models	212
Table 38.	Tier-2 Characteristics Regression Models	214
Table 39.	Tier-3 Characteristics Regression Models	216
Table 40.	Pay Elasticity Coefficients from Econometric Models by Performance Tier	218
Table 41.	Theoretical Current Retention and Budget Situation	219
Table 42.	Comparison of Optimization Model Results	220
Table 43.	Comparison of Mean Probabilities for Promotion to Commander by 18 YCS and by Performance Tier	221
Table 44.	Cost-benefit Analysis of the Trade-off between Retention and Total Cost	223
Table 45.	Comparison of Payment Plans among Performance Tiers (Based on the Solution from the 13-year Retention Optimization Model)	226
Table 46.	Net Present Value (NPV) of Cost Calculations for the Cafeteria-style Bonus Program (Based on the Solution from the 13-year Retention Optimization Model)	227
Table 47.	Comparison of Payment Plans among Performance Tiers (Based on the Solution from the Bonus Differential Optimization Model)	228
Table 48.	Net Present Value (NPV) of Cost Calculations for the Cafeteria-style Bonus Program (Based on the Solution from the Bonus Differential Optimization Model)	229

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ABOUT THE AUTHORS

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Lieutenant Ryan Mudd, United States Navy Reserve, recently graduated from the Manpower Systems Analysis program, earning a Master of Science in Management at the Naval Postgraduate School, Monterey, California. LT Mudd also earned a Master of Science in Operations Management from the University of Arkansas in 2006 and is a certified Senior Professional in Human Resources (SPHR). He was commissioned through the NROTC Commissioning Program upon earning a Bachelor of Science in Psychology from the University of Illinois at Urbana-Champaign in 2000. LT Mudd served as Electronic Warfare Officer onboard USS BRISCOE (DD 977), Navigator and Administration Department Head onboard USS AUSTIN (LPD 4), and Officer Program Manager on the staff of Commander Navy Recruiting Command (CNRC) in Millington, Tennessee. As a Full Time Support (FTS) Human Resources Officer, his next assignment is to Navy Personnel Command (PERS-9) as the IRR Force Management Officer.

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I. INTRODUCTION

The [sic] ultimate goal of military compensation is to get the right Sailor, with the right skills and experience, to the right place, at the right time, for the best value. (Busch, 2006, p. 1)

Since its inception, the United States Navy has always relied on its officers to lead Sailors and Marines in peacetime and during times of war. Therefore, maintaining a corps of high caliber and fully qualified naval officers is essential to the Navy's success. During a period of increasing military demands and direct competition from the civilian sector for high-quality Surface Warfare Officers (SWOs), retaining these officers requires new and innovative approaches. As retention issues become increasingly more critical in the SWO community, this study examines the retention effect of adding a performance-based component to Surface Warfare Officer bonuses.

A. BACKGROUND

The military can be classified as an internal labor market with a compensation system that significantly differs from standard compensation theory for a competitive labor market (Asch & Warner, 2001). According to Rosen (1992), an internal labor market has few "ports of entry" and ports of exit, at which employees either enter or leave the organization (p. 227). Employees are "home grown," as they attain their positions through job transfer and internal promotions (Rosen, 1992, p. 227). Due to virtually no lateral entry into the SWO community, the Navy must rely on retention and internal promotions to fill more senior positions (Asch & Warner, 2001). For example, most Admirals (O-7 through O-10) entered the officer corps as Ensigns (O-1) and promoted through the ranks over a 25- to 35-year period. The Navy only participates in a competitive labor market at "ports of entry" (during initial accession) and at ports of exit (after completing one's active duty service obligation). In order to attract and retain quality Surface Warfare Officers at these critical career points, the Navy must compete with civilian companies and other government agencies for the same talent pool of managers and leaders.

Operating in a restricted labor market, the Navy compensation system must remain competitive to retain naval officers. Since 1973, the military has employed a tiered basic pay scale, in which pay grade (rank) and time-in-service are used to calculate a service member's basic pay (DACMC, 2006). This pay scale rewards tenure, where tenure acts as a proxy for human capital. For example, a senior SWO, who is experienced and better trained, is more valuable to the military than a more junior officer. The current military pay scale lacks a specific performance metric, since overall job performance and mission contribution are not financially rewarded. However, the Navy's "up-or-out" promotion policy provides an incentive for at least average performance, since an officer will not promote to the next higher rank if performance is sub par (Asch & Warner, 2001, p. 525).

To specifically address retention in the SWO community, the Navy implemented several pay incentives, or bonuses, including:

- Surface Warfare Officer Continuation Pay (SWOCP)
- Junior SWO Critical Skills Retention Bonus (CSRB)
- SWO Critical Skills Bonus
- Senior SWO CSRB.

These pay incentives are specific to the SWO community and do not address retention issues affecting other naval officers. However, how much benefit do these pays contribute to the SWO community? After several years of these retention bonuses, the Navy's manpower shortages persist in the mid-grade and senior SWO ranks. Furthermore, these SWO retention bonuses are void of a performance metric, since all eligible officers receive identical bonus payouts and incur the same obligation.

By comparison, according to Corporate Leadership Council (CLC) survey data, many civilian firms use tailored, performance-based compensation systems to attract and retain employees (CLC, 2002). A performance-based compensation system (also called a pay-for-performance system) includes a variable pay structure that offers bonuses, rewards, or basic pay adjustments that correspond to individual employee performance

(CLC, 2006). Thus, pay is not based solely on tenure, but rather on a combination of tenure and individual performance. Moreover, employee bonuses are contingent upon on-the-job performance, as opposed to additional contractual employment obligations.

The Department of Defense (DoD) developed a performance-based compensation system for federal employees when the National Security Personnel System (NSPS) was enacted in 2003 (GAO, 2005). This system, which replaces the previous government civil service pay system, rewards employees by providing performance-based raises. With the civil service portion of the DoD switching to a new performance-based compensation system, the military is considering a modification to its compensation structure as well. For example, the Defense Advisory Committee on Military Compensation (DACMC) has recently recommended changing the current military pay system. The basis for this recommendation is captured in the April 2006 DACMC report to the Secretary of Defense, which states:

The compensation offered to both active and reserve members—coupled with patriotism and the willingness to serve—is, arguably, the most important factor affecting the military services’ ability to staff the force with qualified people. It is certainly the most important factor that can be affected by policy [...and] the current compensation system can be improved in a way that will offer greater flexibility for force managers and results in an even more effective and efficient force. (DACMC, 2006, p. 1)

Although alternative pay structures in the military are limited due to legislative and policy constraints, the addition of a performance-based component to the SWO Critical Skills Bonus may be a viable option with minimal policy reform. Such a system could provide more flexibility in the distribution and allocation of retention incentives to better support force management goals and create greater system efficiencies (DACMC, 2006). As a pilot program, the SWO Critical Skills Bonus may be an appropriate vehicle through which to apply performance-based compensation theory to improve mid-career retention and officer quality in the SWO community.

B. OBJECTIVES

The objectives of this study are to analyze the Surface Warfare Officer retention problem and to evaluate performance-based compensation systems to determine if a change to existing retention bonuses can combat SWO retention issues. This thesis:

- Analyzes SWO retention issues and factors influencing retention.
- Studies the current military compensation system, with emphasis on SWO incentive pays.
- Discusses Congressional legislation and policy affecting military compensation.
- Reviews the performance appraisal and promotion systems for naval officers.
- Examines compensation theory in civilian labor markets.
- Assesses compensation and incentive systems used in federal demonstration projects, the Department of Homeland Security (DHS), the National Security Personnel System, and civilian companies to identify best practices and potential pitfalls.
- Models the 13-year retention effect of adding a performance-based component to the SWO Critical Skills Bonus.
- Addresses legislative, policy, and cultural implications for implementing this revised program in the Department of the Navy.
- Recommends a new performance-based component for the SWO Critical Skills program.

C. RESEARCH QUESTIONS

The research questions examined in this thesis are:

1. Will adding a performance-based component to the Surface Warfare Officer Critical Skills Bonus affect retention?

2. If a performance-based bonus is found to have a positive effect on SWO retention, how could the Navy adopt this compensation program?

D. HYPOTHESIS

This study hypothesizes that the addition of a performance-based component to the Surface Warfare Officer Critical Skills Bonus program will influence officers' decisions to retain. Moreover, it will positively affect retention of high-performing SWOs, but will negatively affect retention of low-performing SWOs. This hypothesized relationship between a performance-based component and retention promotes functional turnover (i.e., loss of poor employees) while reducing dysfunctional turnover (i.e., loss of exceptional employees), which is an ideal situation for Navy manpower planners (Sturman, Trevor, Boudreau & Gerhart, 2003). However, several legislative, policy, and cultural changes are necessary for implementing a performance-based component to SWO bonuses.

E. RESEARCH METHODOLOGY

This thesis provides a qualitative analysis, focusing on policy implications of a performance-based compensation system for Surface Warfare Officers, coupled with a study of pay-for-performance systems in civilian companies and federal organizations. Statistical econometric and optimization modeling techniques are applied to Defense Manpower Data Center (DMDC) personnel and pay records to predict the 13-year retention effect of adding a performance-based component to the SWO Critical Skills Bonus program. Specifically, the methodology includes:

- An extensive literature and policy review.
- Statistical regression models showing the effect of performance on 13-year retention, characteristics among different levels of performance, and performance-level pay elasticities.

- Optimization models predicting the 13-year retention effect of varying bonus payments by performance level, creating a performance-based component for the SWO Critical Skills Bonus.
- Suggested legislative and policy changes required for implementation of the revised bonus program.

F. BENEFITS

This thesis explores performance-based compensation and its effect on retention. Since few studies use statistical data analysis methods to study performance-based compensation systems, this study's methodology furthers Navy research in this field. Furthermore, this thesis provides recommendations to improve SWO retention and the quality composition of the SWO community. Also, the proposed performance-based component of the SWO Critical Skills Bonus supplies a framework for future pay system transformation. This study's analysis of current compensation and retention practices can significantly impact the Navy's ability to execute future compensation reform.

G. SCOPE LIMITATIONS

This thesis specifically examines the potential effect of performance-based compensation on the retention of Surface Warfare Officers. The ramifications are not addressed for the implementation of such a program in other officer communities, for enlisted Sailors, or in other branches of military service. However, this narrow focus allows for direct comparison to civilian companies employing performance-based bonus systems to address management retention issues. The Navy has a history of utilizing bonuses, special pays, and incentive pay programs to address retention issues for specific officer designators and skill sets. Thus far, however, no bonus programs address performance differentials.

Another limitation encountered in this study is the use of performance-based pay systems of civilian companies, federal demonstration projects, DHS, and NSPS as the framework for developing a military bonus structure. These institutions have significantly different organizational cultures, traditions, and funding. However, since

they compete for the same labor pool of managers and leaders, it is important to consider each of their compensation techniques for attracting and retaining talent.

This thesis provides a snapshot of performance-based compensation systems in theory and practice, including their effect on retention. The recommendations of this study focus on SWO applications and provide a foundation for further compensation reform.

H. ORGANIZATION

The structure of this thesis is organized in the following manner:

CHAPTER I: INTRODUCTION

CHAPTER II: SURFACE WARFARE OFFICER RETENTION

This chapter focuses on factors affecting employee retention, human motivation, and intrinsic and extrinsic rewards. The first section discusses the military as an internal labor market, specifically pertaining to the Navy. The second section reviews the SWO career path, including critical retention points. The third section analyzes current SWO retention issues. The final section addresses factors that influence retention.

CHAPTER III: CURRENT POLICIES AND LEGISLATION AFFECTING SURFACE WARFARE OFFICERS' PAY, PERFORMANCE EVALUATION, AND PROMOTION

The current military pay system and compensation policy are detailed in this chapter. The first section discusses the military compensation system for Surface Warfare Officers, including the four incentive pays (i.e., bonuses) used to address retention in the SWO community. The second section analyzes the legislative process for military compensation. The third section covers the SWO performance evaluation system (i.e., Fitness Reports). The final section reviews the SWO promotion process.

CHAPTER IV: PERFORMANCE AND COMPENSATION THEORY

This chapter discusses performance and compensation theory. The first section addresses labor economic theory influencing performance, promotion, and compensation. The second section examines organizational behavior theory behind performance-based pay systems.

CHAPTER V: PERFORMANCE-BASED COMPENSATION IN PRACTICE

This chapter reviews pay for performance in the labor market. The first section discusses implementing performance-based compensation and reviews commonly used pay systems. The second section studies performance-based compensation demonstration projects at several federal agencies. The third section examines a return-to-skills study of General Schedule (GS), Performance Management Recognition System (PMRS), and China Lake compensation systems. The fourth section analyzes two recent conversions to performance-based compensation systems: the Department of Homeland Security (DHS) and the National Security Personnel System (NSPS). The fifth section discusses civilian-sector performance-based compensation. The final section analyzes problems with performance-based compensation implementation.

CHAPTER VI: MODELING THE RETENTION EFFECT OF ADDING A PERFORMANCE-BASED COMPONENT TO THE SWO CRITICAL SKILLS BONUS

In modeling the 13-year retention effect of adding a performance-based component to the SWO Critical Skills Bonus, this chapter discusses the dataset and sample, variables, methodology, descriptive statistics, results of econometric and optimization models, and model limitations.

CHAPTER VII: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter provides the summary, conclusions, and recommendations of this thesis. The first section examines legislative, policy, and procedural changes required to facilitate program implementation, including a discussion of predicted cultural resistance to change. The second section presents the conclusions of this study, while the final section provides recommendations for program implementation and future research.

II. SURFACE WARFARE OFFICER RETENTION

A. OVERVIEW

Keeping a talented workforce is a challenging task for any organization. This chapter focuses on factors affecting employee retention, human motivation, and intrinsic and extrinsic rewards. The first section discusses the military as an internal labor market, focusing specifically on the Navy. The second section discusses the career path of Surface Warfare Officers (SWO) to include critical retention points. The third section reviews current retention issues among SWOs. The final section analyzes factors that influence retention.

B. MILITARY AS AN INTERNAL LABOR MARKET

The US military is a large, hierarchical organization with a stringent chain-of-command administrative and operational structure that meets the criteria of an internal labor market (Asch & Warner, 2001). As such, the military faces challenges associated with the design of an internal labor market: limited lateral entry, an up-or-out promotion system, and lack of “skewness” in the pay structure (p. 524). The military, naval officers in particular, must contend with these critical issues.

1. Recruiting and Retention

An internal labor market has few “ports of entry,” which are points in time when employees can either leave or join an organization (Rosen, 1992, p. 227). At each port of entry, the Navy must compete with outside organizations in external labor markets. In order to attract and retain talent, the Navy must offer competitive wages and benefits—both tangible and intangible. Wages consist of basic pay, allowances, special and incentive pays, annual pay adjustments, and tax advantages. Tangible benefits include medical care, dental care, and reduced-cost life insurance policies. Intangible benefits include military-specific and general training, education, and the opportunity to serve

one's country. Consciously and subconsciously, individuals must weigh disparity between military and civilian costs and benefits before deciding to join naval service or to remain in the civilian sector.

For the Navy, the entry port occurs when a Sailor is recruited. Naval officers receive commissions through a variety of sources, such as the US Naval Academy, Naval Reserve Officer Training Corps (NROTC), or Officer Candidate School (OCS). Since there is limited lateral entry due to the specificity of most military skills, recruiting quality naval officers at the entry level and lower rungs of the Navy's hierarchy is essential (Asch & Warner, 2001). The senior officers of tomorrow are the junior officers of today. Since the Navy must compete with civilian and other government organizations for the same talent pool, the task of recruiting officers for particular specialties can be arduous. With an increased operations tempo, a robust civilian economy, and a decreasing propensity for military service, the Navy is challenged to recruit the best talent for the Surface Warfare Officer community (Mullen, 2007).

Subsequent ports or decision points beyond accession are hereby referred to as ports of exit—since service members either choose to stay or quit, but new officers cannot enter (Rosen, 1992). Most service members enter into an initial contract of service obligation before they are accessed and sent to initial training. For naval officers, the initial obligation or minimum service requirement (MSR) depends on the commissioning source and the specific officer community to which they are designated. An Ensign (O-1), who earned a commission through the NROTC program and is designated as a SWO, has an initial obligation of four years. However, if that same Ensign were to be commissioned through the US Naval Academy, then the MSR would be five years. After the MSR has expired, officers reach a crossroad at which they must decide whether or not to continue service.

At these ports of exit, the Navy must entice a certain number of officers to retain (in other words, to remain in service), in accordance with the *Defense Officer Personnel Management Act (DOPMA)* Officer Management System (Rostker, Thie, Lacy, Kawata & Purnell, 1993). If a specific officer community is having trouble retaining the requisite number of officers, then retention bonuses and special pays are offered to increase the

officers' willingness to stay. Generally, the programs attach an obligation in order to retain the officer past a certain career milestone. Specifically, Surface Warfare Officers are offered \$50,000 through the Surface Warfare Officer Continuation Pay (SWOCP) retention program for committing to two department head tours, which add approximately five to six years of obligation past the first port of exit (Chief of Naval Operations, 2005b). Additionally, SWOs are offered \$25,000 through the Junior SWO Critical Skills Retention Bonus (CSRB) for a similar commitment. Both SWOCP and the Junior SWO CSRB can be taken concurrently, so SWOs are actually offered \$75,000 to retain through two department head tours—totaling nine to eleven years of commissioned service (Chief of Naval Operations, 2006).

Advanced educational opportunities are provided for SWOs approaching a port of exit decision. If accepted for an educational program, a corresponding obligation is incurred based on program length. For example, attending and graduating from the Naval Postgraduate School obligates naval officers to three-year commitments for Master's Degree programs (Chief of Naval Operations, 2007). Both monetary and educational incentives are used by the Navy as officer retention tools.

However, if naval officers are not under an obligation associated with a bonus or educational benefit, then they are at a constant port of exit, with the choice to leave or stay constantly pending. During these critical decision points, external factors (i.e., civilian job opportunities) influence officers' retention decisions. The structure of the military's hierarchy is designed to account for a reasonable loss of officers at early ports of exit, since not all Ensigns can expect to achieve the rank of Admiral. Fairris (2004) postulates that internal labor markets can positively influence retention behavior by developing "long job ladders," substantial pay growth within these ladders, and a seniority system that reduces the politics involved in promotion (p. 592). The Navy has inklings of these characteristics in its organizational structure.

2. Promotion

Another important characteristic of an internal labor market is that workers are "home grown," or promoted from within the organization (Rosen, 1992, p. 227). Due to

the lack of lateral entry, the Navy relies on its promotion system to fill its senior ranks. SWOs are promoted through Lieutenant (O-3) based on qualifications, minimum time-in-rank, and minimum time-in-service (Asch & Warner, 2001). For subsequent ranks, centralized promotion boards decide officers' fates (Asch & Warner, 2001). Rosen (1992) suggests that the importance of the selection process increases with the level of rank, since the levels of authority and responsibility also increase dramatically as an officer is promoted through the ranks. The more senior the officer, the more valuable that officer becomes to the Navy, due to increased human capital. Furthermore, superior work effort and ability has a spillover effect, where subordinates are motivated to increase productivity under the leadership of high performers (Asch & Warner, 2001). This increase in total productivity for the organization makes high-quality officers even more indispensable. Figure 1 is a graphical depiction of the inverse relationship between the officer inventory size and the value of officers to the Navy at each rank.

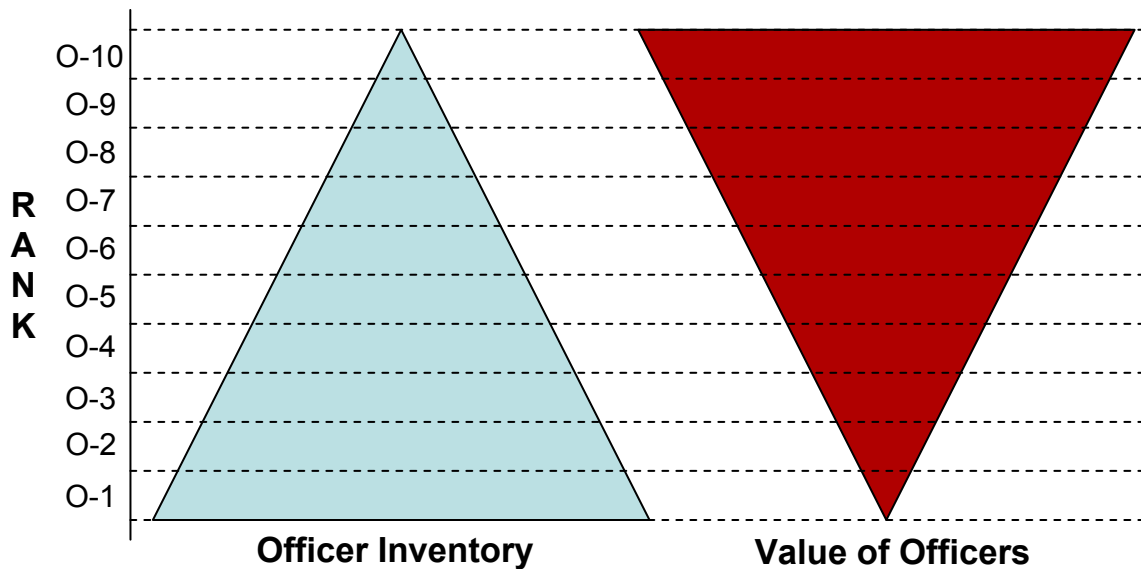


Figure 1. Inverse Relationship between Officer Inventory and the Value of Officers to the Navy

The Navy's statutory officer promotion boards are held annually, and board members select qualified officers for promotion based on the quality of their service record. Service records contain fitness reports (annual officer job evaluations), educational history, qualifications, subspecialty codes that reflect Navy-specific skill sets,

a history of past assignments, Joint Professional Military Education (JPME), and personal awards. According to Asch and Warner's (2001) interpretation of promotion tournaments, individuals are evaluated on both ability and work effort. The Navy's promotion system considers both these characteristics, which are captured in service records, when selecting officers for promotion. However, unobserved factors may also contribute to promotion decisions. Promotion boards consider officers who are "fully qualified" and then select those who are "best qualified" (Secretary of the Navy, 2007b, p. B-1). According to the Secretary of the Navy (2007b), "fully qualified" officers are able to perform the duties of the next higher pay grade, while "best qualified" status is assigned to officers after being evaluated in the following four areas:

1. Proven and sustained performance
2. Education, personal, and professional development
3. Ability to meet statutory promotion objectives
4. Achievement of competency and skill requirements (pp. B1-B3).

Because of the hierarchical structure of the Navy, there are a limited number of openings for senior-ranking officers, as dictated by *DOPMA* grade tables (Rostker et al., 1993). Beginning with the rank of Lieutenant Commander (O-4), the Navy limits the number of officers, within each officer community, who can be promoted to the next rank. Based on this restriction, the promotion system acts as a contest (i.e., tournament), in which officers compete with their peers for a limited number of promotion slots (Asch & Warner, 2001). This competition creates an incentive for officers to increase their work effort, which reduces individual shirking. The promotion rate also depends on the cohort retention rate (Asch & Warner, 2001). As more officers retain, more officers who are "fully qualified" compete during the next promotion cycle. This situation creates a higher-quality cohort at the next rank, since the promotion board screens and selects only the best candidates. Therefore, as fewer officers retain, the officer pool (both "fully" and "best qualified") considered by the promotion board is smaller. This problematic circumstance forces the Navy to promote officers who may not have been "best qualified" in a larger cohort.

Additionally, the Navy's promotion system contains an "up-or-out" clause (Asch & Warner, 2001, p. 525). If naval officers (O-2 through O-4) fail to select for promotion to the next rank after two annual promotion cycles, then they can be processed for involuntary separation (Secretary of the Navy, 2005). According to SECNAVINST 1920.6C, even if they twice failed to select, most Lieutenant Commanders (O-4) are generally given leeway to retain on active duty until retirement at 20 years of service (Secretary of the Navy, 2005). Commanders (O-5) and Captains (O-6) have similar "up-or-out" requirements, with the same twice-fail-to-select criteria and mandatory retirement by 28 and 30 years, respectively (Secretary of the Navy, 2005). Asch and Warner (2001) state that "by generating turnover, up-or-out rules and minimum performance standards increase the promotion opportunities for others when some are forced to leave, which increases retention of those who meet the standard" (p. 538).

Arguably, officers not promoted after two opportunities have lower ability and lower productivity, as evidenced by their non-selection by two separate boards. The performance standard increases with the level of rank, which, in turn, motivates "high-taste" and "high-ability" officers to work harder (Asch & Warner, 2001, p. 538). Harder work effort yields earlier promotions, which ensures that "high-taste" and "high-ability" workers promote on time. This symbiotic relationship allows the Navy to get the "best bang for its buck" in an all-volunteer force. All officers are persuaded to remain productive, and only the "high-taste" and "high-ability" officers promote to the most senior positions. Therefore, in theory, Admirals should be the hardest working officers with the highest ability among their initial accession cohorts. In reality, the politics of the Navy's promotion process become more prominent in both the mid-grade and upper-echelon levels. Sometimes "who you know" or "visibility" can influence promotions as much as actual, documented performance (Schwind & Laurence, 2006, p. S85). In reference to Admirals, Schwind and Laurence (2006) argue that:

By the time an officer reaches the senior levels, the promotion process has normally prevented substandard performers from attaining higher rank, and thus, all performance evaluations at this level tend to be stellar. The distinguishing factor among officers at this career point is visibility ... [the] actual impact of performance lessens as an officer rises in seniority and the visibility factor increases dramatically. (pp. S85–S86)

3. Pay Structure

According to the Efficiency Wage Theory, employers in internal labor markets use “efficiency wage strategies, where employers raise wages above competitive market rates in order to promote productivity or deter shirking” (Doeringer, 1986, p. 48). For the Navy, an officer’s pay is dictated by the military’s tiered basic pay table, in which pay grade (rank) and time-in-service (seniority) are used to calculate basic pay (DACMC, 2006). This compensation is fairly competitive for junior managers, but loses its edge for more senior talent. Due to the lack of lateral-entry and “home grown” senior officers, the Navy must offer competitive wages to attract a talented entry pool that has the potential to perform the entry-level jobs of today and the higher-level jobs of tomorrow (Asch & Warner, 2001, p. 551). If the Navy had perfect information about officers’ productivity, then labor economic theory would deduce that the Navy should pay wages (W) equal to an officer’s marginal product of labor (MP_L) (Ehrenberg & Smith, 2006). However, to recruit high-ability officers, the military pay system was designed to set initial wages above their MP_L , especially since most officers spend the majority of their first years in training. This situation creates an economic deficit for the organization, resulting from salaries paid at the junior officer ranks. Conversely, senior officers’ wages are well below their MP_L , creating an economic surplus in the upper ranks (Asch & Warner, 2001). According to Asch and Warner (2001), the economic surplus at the higher ranks funds the overpayments (deficit) in the lower ranks.

To achieve equilibrium so that $\sum W = \sum MP_L$ across all pay grades, the Navy’s pay scale exhibits a lack of “skewness,” in which pay at lower levels is close to pay at higher levels, when compared to civilian compensation schemes (Asch & Warner, 2001, p. 524). For example, “The typical O-6 [Captain] receives about three times the pay of an O-1 [Ensign] ... By contrast, Baker, Gibbs, and Holmstrom (1994b) report that level 6 managers in the firm they studied earned about five times the amount earned by level 1 managers” (as cited in Asch & Warner, 2001, p. 524).

With such a disparity between the relative pay in civilian firms and the military, an officer’s decision to retain is significantly influenced by the military pay structure and

in-kind benefits (Asch & Warner, 2001). Holding all other factors equal, and based solely on relative pay, an officer with perfect information about the labor market would choose to resign and seek employment in the civilian sector. However, officers consider more than basic pay when making informed retention decisions. Since the basic pay table recognizes seniority in addition to rank, it provides an incentive to remain on active duty longer. Nonetheless, seniority only has a marginal impact, since high-performing and high-ability officers also expect to move up on the pay grade (rank) axis of the pay table.

Under the military pay structure, naval officer pay is significantly influenced by individual performance as it affects promotion status. According to Baker, Gibbs, and Holmstrom (1994a), workers are placed on the “fast track” when assigned jobs in which their productivity is highest, which in turn yields faster promotions (p. 901). For the Navy, officers are considered on the fast track when they outperform their peers, resulting in earlier promotion to the next rank and more challenging job assignments. Baker et al. (1994a) argue that “those promoted quickly once should be promoted quickly again” (p. 901). Likewise, naval officers on the fast track generally stay on the fast track since the Navy continues to recognize high performance and successful completion of challenging job assignments during the promotion process.

However, the speed of promotion on the fast track is limited by Navy policy, which regulates the required time-in-grade before promotion to the next rank.¹ Furthermore, since the years-of-service component of the pay table recognizes seniority, the reward for early promotion for officers on the fast track has a reduced effect (Rosen, 1992, p. 235). As Rosen (1992) states:

If a person works hard to get on the fast track, the gain is temporary and small because others are soon promoted anyway and receive the same pay. The person on the faster track gains only a temporary advantage often not worth the extra effort (p. 235).

¹ The “fast track” is limited by promotion zones established for each statutory promotion board.

Additionally, the presence of a fast track creates increased competition among officers. This competition can be healthy if kept under control, but can become a burden if there is proven discrimination against officers not on the “fast track.”

Due to the lack of skewness in the military pay table, basic pay alone is insufficient to attract and retain talent in the surface warfare community. At this point, the military retirement pension plan becomes an influencing factor. After 20 years of service, a Sailor is vested in the pension plan that provides an immediate, inflation-protected annuity (Asch & Warner, 2001).² According to Rosen (1992), the retirement pension may be the prevailing force for retention after completing a second “tour,” or obligation period—possibly around nine to eleven years of commissioned service for the SWO community (p. 232). Officers with higher probabilities of retention place larger weights on long-term rather than short-term compensation (Asch & Warner, 2001). They value the long-term benefits of receiving a regular retirement paycheck each month throughout their retirement years, compared to a potentially higher immediate salary in the civilian sector. Arguably, officers who place more emphasis on long-term payoffs will be more loyal, in terms of retention, to the Navy. They are willing to forgo the immediate rewards of higher-paying civilian jobs for the opportunity to eventually recapture their economic rents (from the lower military pay collected while on active duty) in retirement.

C. THE SURFACE WARFARE OFFICER CAREER PATH

Historically, the typical SWO career path was standardized, and deviations from the norm were discouraged. However, due to changing requirements in the SWO

² There are three retirement plans available for military members based on the date they initially entered military service (DIEMS): FINAL PAY, HIGH-3, and REDUX. Under the FINAL PAY plan, Sailors with a DIEMS date prior to September 8, 1980, receive retired pay computed as 2.5 percent times the number of years of service, multiplied by their final basic pay at date of retirement. Under the HIGH-3 plan, Sailors with a DIEMS date between September 8, 1980, and July 31, 1986, receive retired pay computed as 2.5 percent times the number of years of service, multiplied by the average of the highest 36 months of basic pay. Under the REDUX plan, Sailors with a DIEMS date of August 1, 1986, (or later) receive retired pay computed as “(2.5 [percent] times the number of years of service minus one percent for each year under 30 years of service) times the average of the highest 36 months of basic pay during that service.” The REDUX plan was modified with the FY 2000 *National Defense Authorization Act*, which allowed for a choice between HIGH-3 and a modified-REDUX plan (with a \$30,000 Career Status Bonus at the 15-year point). (Defense Finance and Accounting Service, 2007)

community, the career path currently has added flexibility and alternative opportunities. The following sections discuss the career opportunities for Surface Warfare Officers, including potential ports of exit.

1. From Accession through the First Department Head Tour

Figure 2 displays the current SWO career path from an officer's commissioning through the first department head tour, with the top gray bar showing cumulative years of commissioned service.

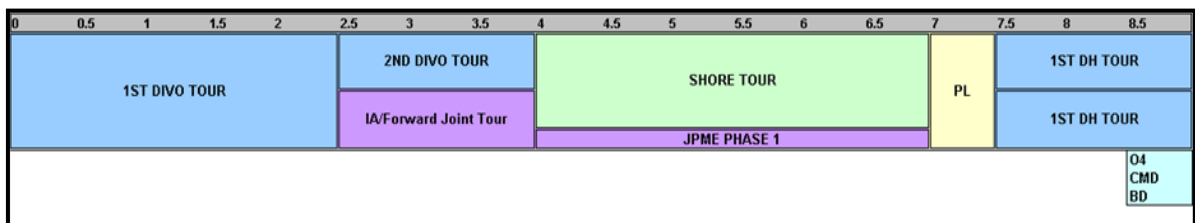


Figure 2. SWO Career Path from Accession through the First Department Head Tour (Commander Naval Surface Forces, 2008b, p. 4)

For officer cohorts accessing prior to 2005, Surface Warfare Officers attended division officer training at Surface Warfare Officer School (SWOS) in Newport, RI, for six months before reporting aboard their first ship. However, more recent cohorts have reported directly to their first division officer (DIVO) tour. Brick-and-mortar SWOS was replaced by the DIVO “SWOS at Sea” program, allowing junior Surface Warfare Officers to complete computer-based training modules at a self-paced speed, in lieu of classroom instruction. In addition to completing “SWOS at Sea,” DIVOs are expected to earn their Officer of the Deck Underway (OOD U/W) qualification before proceeding to SWOS for a three-week validation course, taught in the classroom and with simulators. After completing the three-week course, junior SWOs report back onboard their ship to complete their Surface Warfare Officer qualification prior to finishing their first DIVO tour. This qualification process is further illustrated in Figure 3. (Commander Naval Surface Forces, 2008a; Commander Naval Surface Forces, 2008b)

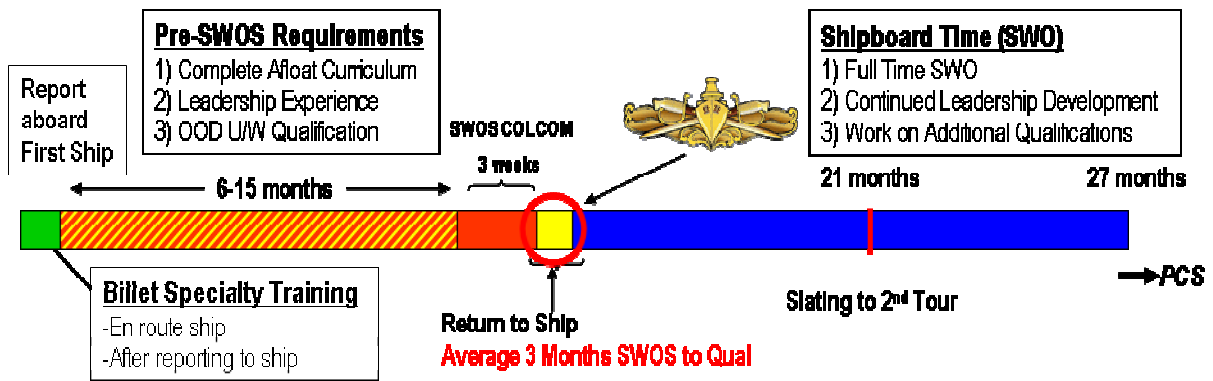


Figure 3. SWO Qualifications during the First Division Officer Tour
 (Commander Naval Surface Forces, 2008a, p. 5)

Upon completing the first DIVO tour, SWOs are assigned second DIVO billets on different Navy warships. During this tour, they are expected to qualify as Engineering Officer of the Watch (EOOW), if not previously earned (Commander Naval Surface Forces, 2008a). If junior SWOs previously qualified as EOOW during their first DIVO tour, they are eligible for assignment to an Individual Augmentation (IA) billet in a forward-deployed area, such as Iraq or Afghanistan, in lieu of a second DIVO tour at sea (Chief of Naval Operations, 2008b).

At approximately four years of commissioned service (YCS), Surface Warfare Officers are eligible for their first shore duty. A variety of shore billets are available, including graduate education institutions and various staff duties. During this period ashore, SWOs also have the opportunity to complete Joint Professional Military Education (JPME) Phase I. Most officers finish their initial minimum service requirement during this shore tour and are faced with a critical retention decision at this port of exit. (Commander Naval Surface Forces, 2008b)

If choosing to retain beyond the first shore duty assignment, Surface Warfare Officers report to SWOS for a six-month Department Head School. Upon graduation, SWOs report for their first department head (DH) tour at sea. In addition to normal duties, DHs are expected to qualify as Tactical Action Officers (TAOs). If requested, high performing DHs also have the opportunity to screen for Lieutenant Commander

Command, generally as the commanding officer of a mine countermeasure (MCM) Avenger-class ship or a coastal patrol (PC) combatant craft (Commander Navy Personnel Command, 2007b).

2. Second Department Head Tour through Executive Officer (XO) Tour

As illustrated in Figure 4, the SWO career path continues from the second department head tour through the executive officer (XO) tour, with the top gray bar continuing the cumulative years of commissioned service.

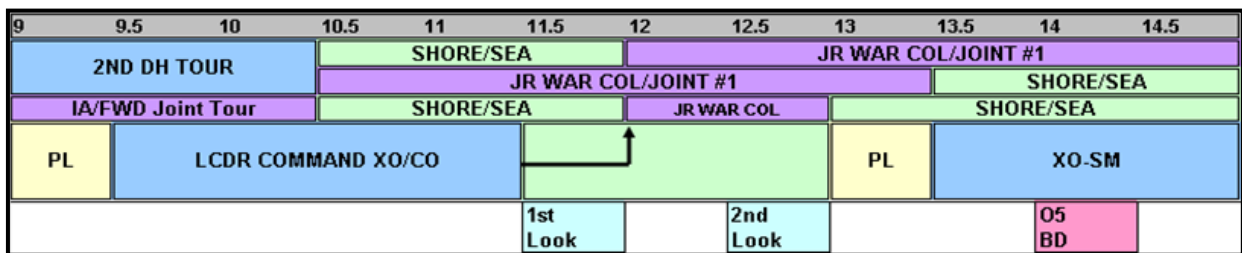


Figure 4. SWO Career Path from the Second Department Head Tour through XO
(Commander Naval Surface Forces, 2008b, p. 20)

At approximately 9 YCS, Surface Warfare Officers report for their second department head assignment. Similar to the alternative DIVO tour, some officers can participate in IA assignments instead of the traditional second DH assignment. Upon completion of their first DH tour, Lieutenant Commander Command-selected officers attend commanding officer (CO) training at SWOS prior to assuming XO and subsequent CO duties onboard their assigned MCM or CO duties onboard a PC (Commander Navy Personnel Command, 2007b). Upon completing the required DH tour obligation, mid-grade SWOs transfer to various shore duty assignments, such as: graduate education, Junior War College, joint-duty assignments, subspecialty tours, and staff billets (Commander Naval Surface Forces, 2008b). During this period, SWOs reach another critical port of exit as the commitment from the Junior SWO CSRB and SWOCP expire. In addition, according to the Chief of Naval Operations (2004b), Lieutenant Commanders (LCDR) can apply for one of six specialty career path programs, which include:

- Anti-terrorism/force protection (AT/FP)
- Anti-submarine warfare

- Missile defense
- Mine warfare specialist
- Shore installation management
- Strategic sealift (MSC/MPF)

Acceptance into one of these six specialty career path programs creates the opportunity for Executive Officer Special Mission (XO-SM) assignment.

3. Commanding Officer (CO) Tour through Major Command

Figure 5 illustrates the senior portion of the SWO career path, with the top gray bar continuing the cumulative years of commissioned service.

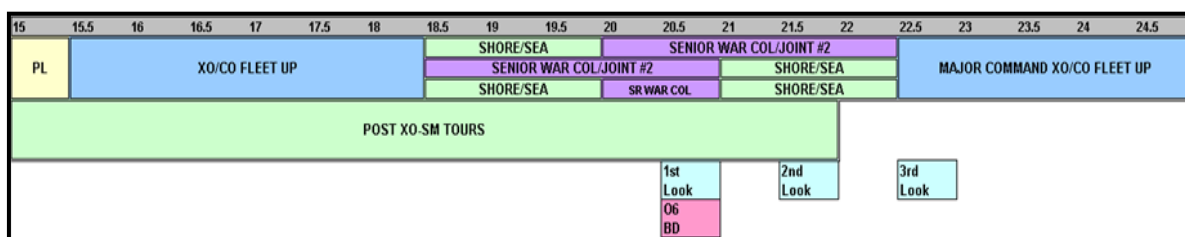


Figure 5. SWO Career Path from CO through Major Command
(Commander Naval Surface Forces, 2008b, p. 32)

If Surface Warfare Officers continue on the traditional SWO career path, they then screen for Commander Command. If selected, they transfer to SWOS to complete the CO school curriculum before assuming command at sea. After training, these SWOs report onboard their respective warships as XO and eventually “fleet up” to CO aboard the same ship. If not selected for Commander Command, SWOs fill various sea and shore billets. After a successful Commander Command tour, SWOs transfer to a variety of assignments, including a Senior War College, joint-duty assignments, subspecialty tours, or staff billets. At 20 YCS, naval officers face a major port of exit because they become eligible for retirement; thereby, they are entitled to lifetime military retirement pay and benefits. However, if SWOs screen for major command, they can look forward to assuming another command opportunity at approximately 22.5 YCS and, therefore, may be persuaded to retain on active duty. After this point, the SWO career path

becomes less predictable, as Surface Warfare Officers compete for flag rank while others choose to retire (Commander Naval Surface Forces, 2008b).

4. Individual Augmentation (IA) and Global War on Terrorism Support Assignments (GSA) during Shore Duty

At various points along the career path, SWOs can be assigned Individual Augmentation (IA) and Global War on Terrorism Support Assignments (GSA) during shore duty intervals. While filling IA and GSA billets, individual naval officers augment or fill Army, Marine Corps, or joint units in forward-deployed areas of the world (GAO, 2007b). These billets involve work generally outside the officer's specialty and require long periods of deployment. Surface Warfare Officers assigned IA tasking often receive little notice and are removed from their shore duty billets for a specified amount of time (Chief of Naval Operations, 2008b). Upon successful completion of IA tasking, officers are reassigned to their previous shore duty assignment, but they are not compensated with a shore duty assignment extension to make up for lost time at home. These unaccompanied tours are generally not included in the SWO career path for shore duty periods. Conversely, GSA billets are offered (or sometimes ordered) to officers as regular assignments at the beginning of the shore duty slating window, thereby increasing the "predictability" of such assignments for officers and their families (Chief of Naval Operations, 2008a, p. 1). Once the GSA requirements are fulfilled, officers are then transferred to other shore duty jobs, if career timing permits (Chief of Naval Operations, 2008a).

Figure 6 displays the current (as of February 2008) snapshot of the number of SWOs filling IA or GSA billets by rank, with the percentage of total Navy officers participating in these programs depicted on the right side y-axis. The majority of surface warfare community IA and GSA assignments affect Lieutenants (O-3) and Lieutenant Commanders (O-4).

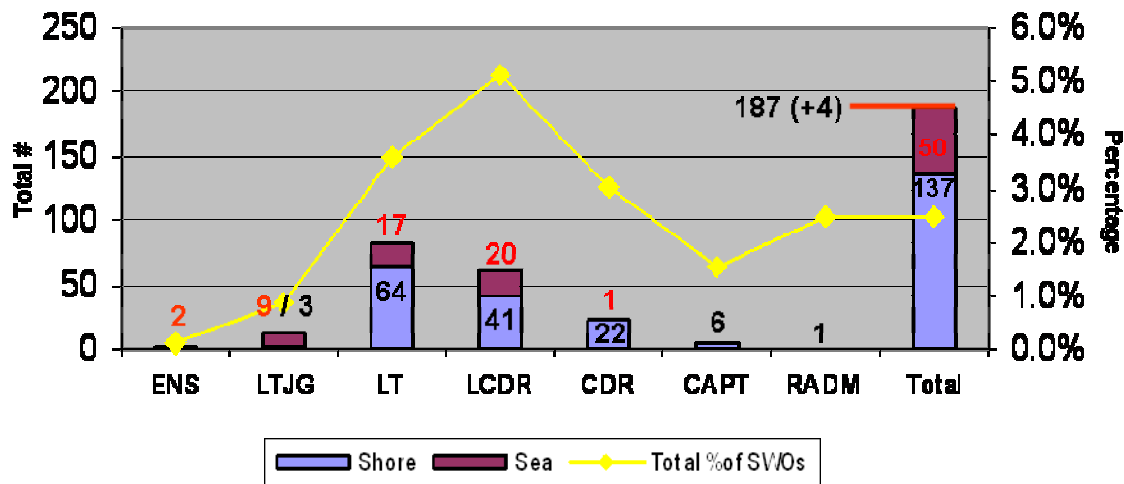


Figure 6. Snapshot of Surface Warfare Officers filling IA and GSA Billets (Commander Naval Surface Forces, 2008b, p. 13)

The Government Accountability Office (GAO) found that senior officer community managers are concerned that naval officers filling Individual Augmentation (IA) billets may have an impact on retention, but the GAO was unable to estimate the actual effect (2007b). As a more recent initiative, the effect of Global War on Terrorism Support Assignments (GSA) on SWO retention is a study in its infancy. In the near future, the Navy will need to capture the effect of IA and GSA assignments on retention to bring the full picture of SWO manpower requirements into focus.

D. RETENTION ISSUES AMONG SURFACE WARFARE OFFICERS

1. SWO Retention

The Navy manages to meet its overall end-strength targets set by the *DOPMA* grade tables. In other words, it achieves aggregate retention goals in terms of the quantity of officers retained, but does not necessarily address the quality of officers who retain (Busch, 2006). Figure 7 depicts the overall retention rates in percentages for naval officers in fiscal years 2001, 2003, and 2005. It is important to note that retention rates are conditional on officers retaining at previous points. For example, the 85-percent retention rate for officers in fiscal year 2001 at ten years of service, means that 85-percent of the officers who are still in service at the ten-year point retain for an eleventh year of service.

Fiscal year and year of service	Academy	ROTC		OCS	Other*	Total
		Scholarship	Nonscholarship			
2001						
Year 3	100	99	86	97	93	96
Year 4	99	85	96	93	89	91
Year 5	91	85	91	90	91	90
Year 10	83	79	81	86	88	85
2003						
Year 3	100	98	98	97	94	97
Year 4	99	86	94	94	89	92
Year 5	91	88	95	93	92	92
Year 10	85	86	93	94	89	88
2005						
Year 3	93	93	87	93	94	93
Year 4	95	85	92	92	89	90
Year 5	90	86	87	92	92	91
Year 10	91	88	88	89	90	89

*This category includes direct commissioned officers in the Navy, interservice transfers, returns to active duty, and officers from unknown sources.

Figure 7. Overall Retention Rates for Navy Commissioned Officers by Commissioning Program for Selected Fiscal Years at Key Ports of Exit
(GAO, 2007b, p. 33)

Even with high overall retention rates, each officer community has difficulty retaining the right mix of officers in specific grades. The Government Accountability Office (2007b) has identified retention problems in the medical, dental, surface warfare, and intelligence officer communities. Specifically, the SWO community has trouble retaining the proper number of mid-grade officers to meet its billet requirements. Figure 8 shows the SWO inventory of officers plotted against the number authorized, Officer Programmed Authorization (OPA), for fiscal year 2008. The yellow area represents fiscal year 2008 OPA, while the bars indicate the number of officers in inventory as of February 2008. Additionally, the area highlighted by the red oval indicates the detrimental gap between SWO inventory and OPA.

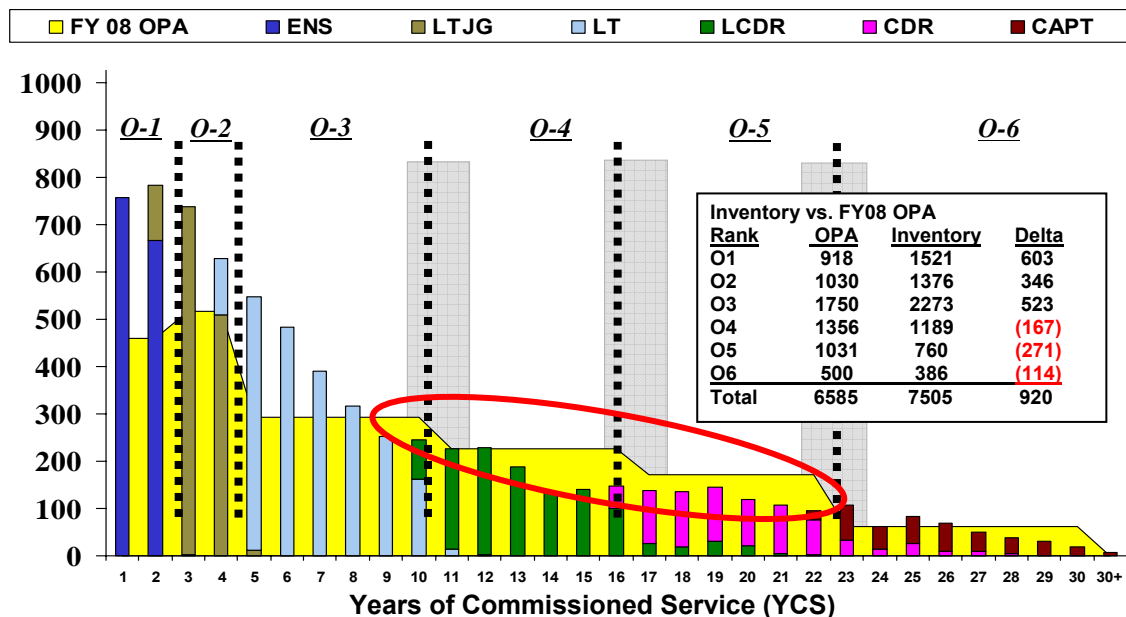


Figure 8. SWO Community Standardized FY08 Inventory
(Adapted from Commander Naval Surface Forces, 2008b, p. 3)

The Surface Warfare Officer community is currently meeting its overall end-strength (total quantity of officers) goal, as Figure 8 shows a total inventory surplus of 920 SWOs compared against OPA. However, shortages exist in mid-grade and senior ranks in various year groups, defined by YCS. Specifically, a shortage in the mid-grade officer ranks starts at Lieutenant (O-3) with nine YCS and continues through Commander (O-5) with 22 YCS. Two years of exceptions occur at the rank of Lieutenant Commander (O-4) with 11 YCS and 12 YCS. While inventory meets or exceeds OPA for the first four years at the Captain (O-6) level, a shortage of senior-grade officers emerges from 27 YCS through 30 YCS. Altogether, the inventory shortage is 552 SWOs, gapped from senior O-3 through O-6 officer ranks (Commander Naval Surface Forces, 2008b).

Figure 9 shows the February 2001 SWO inventory plotted against fiscal year 2000 OPA. To examine the retention trend over time, a comparison of Figure 8 and Figure 9 provides evidence that the current officer shortage has merely shifted to the right, to officers with greater YCS and more senior rank.

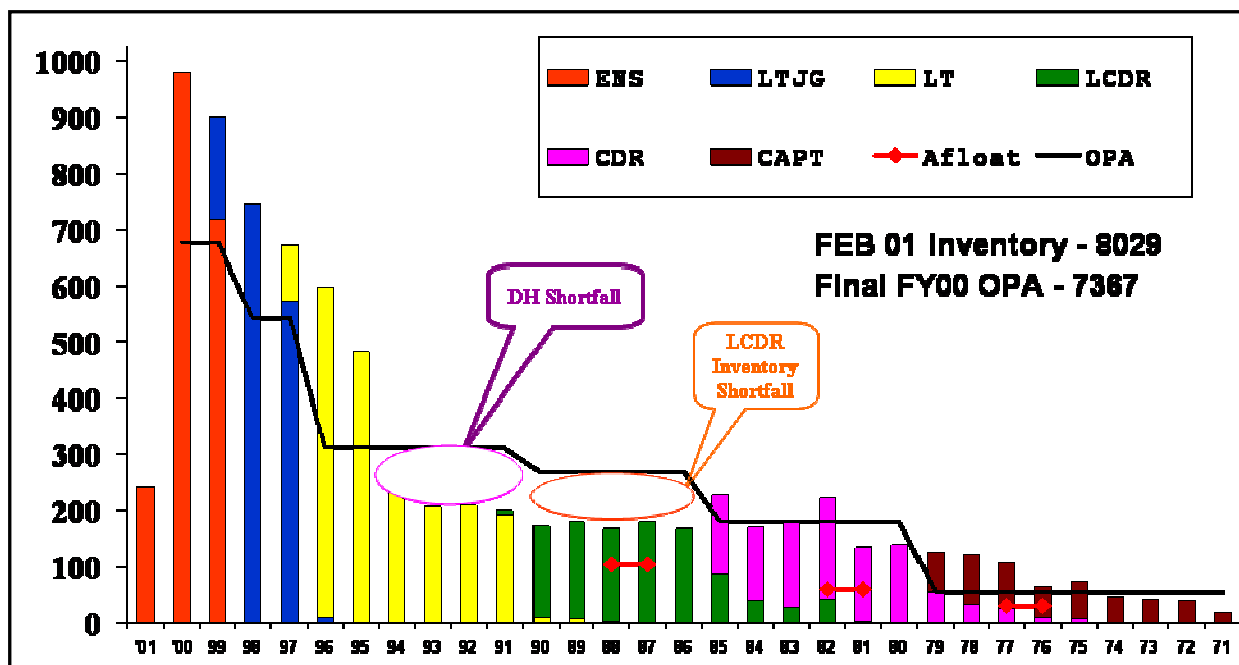


Figure 9. SWO Community February 2001 Inventory Plotted against FY00 OPA (Crayton, Darling & Mackin, 2002, p. 4)

A consistent shortage in the SWO community has continued over the years. However, the year group shortage has improved since 2001 for senior LT (O-3) and junior LCDR (O-4) year groups, but the gaps worsened at the CDR (O-5) level. This may suggest that current SWO retention initiatives, such as SWOCP and Junior SWO CSRB, are helping combat the problem at the pre-department head level. Crawford, Thomas, Mehay, and Bowman (2006) back this assertion, by claiming that introducing “SWOCP is related to an increase in retention of SWOs” (p. 27). However, effects of the Global War on Terrorism may also have impacted the surge in retention (Crawford et al., 2006).

Furthermore, due to promotions over the past eight years and the lack of lateral entry into the SWO community, shortages at junior ranks in fiscal year 2000 (FY00) have progressed into shortages at more senior ranks in FY08. However, the LCDR and CDR inventory shortfall remains quite prominent. These inventory shortages require immediate attention from the SWO community. Convincing more officers at 11 through 13 YCS to retain will improve retention shortfalls in later years, so that later inventory

levels will approach OPA for more senior SWOs. Though the trend among Navy leaders has been to focus attention on SWO retention through department head tours, attention is required in later years as well (Monroe & Cymrot, 2004).

Manning shortfalls in specific pay grades at particular points in time is not conducive for effective fleet readiness. Additionally, manning “gaps” create both hard and soft costs for the Navy (Thie, Harrell, Marquis, Brancato, Yardley, Graff, et al., 2003, p. 91). As defined by Thie et al. (2003), hard costs are quantifiable monetary outlays, such as compensation, accession costs, and training expenditures. On the other hand, soft costs are tough to quantify; they include lower productivity due to deficiencies, readiness issues resulting from low retention, and weak team cohesion (Thie et al., 2003). With the excess of junior officers and a shortage of mid-grade officers, soft costs are incurred as junior officers have to fill billets slated for officers with more experience (Thie et al., 2003). According to Thie et al. (2003), “job performance suffers, and the morale of the junior officers may also decline because of lower job satisfaction and resentment over carrying out responsibilities without being compensated fairly” (p. xix).

2. Differences in SWO Retention by Gender

The SWO retention problem is compounded by the significant difference in SWO retention rates between male and female Surface Warfare Officers. Female SWOs are retaining at a much lower rate than their male counterparts (Commander Naval Surface Forces, 2008b). Figure 10 displays the gender differences in SWO retention by year group (YG), from YG95 through YG04.³ The retention trend analysis beyond YG00 is premature. YG01 through YG04 have not yet “closed out,” since not all officers in these year groups have committed to department head tours (Commander Naval Surface Forces, 2008b, p. 17).

³ Year group (YG) is defined as the year an officer was commissioned. For officers commissioned after December 15 of a given year, their year group is the following year.

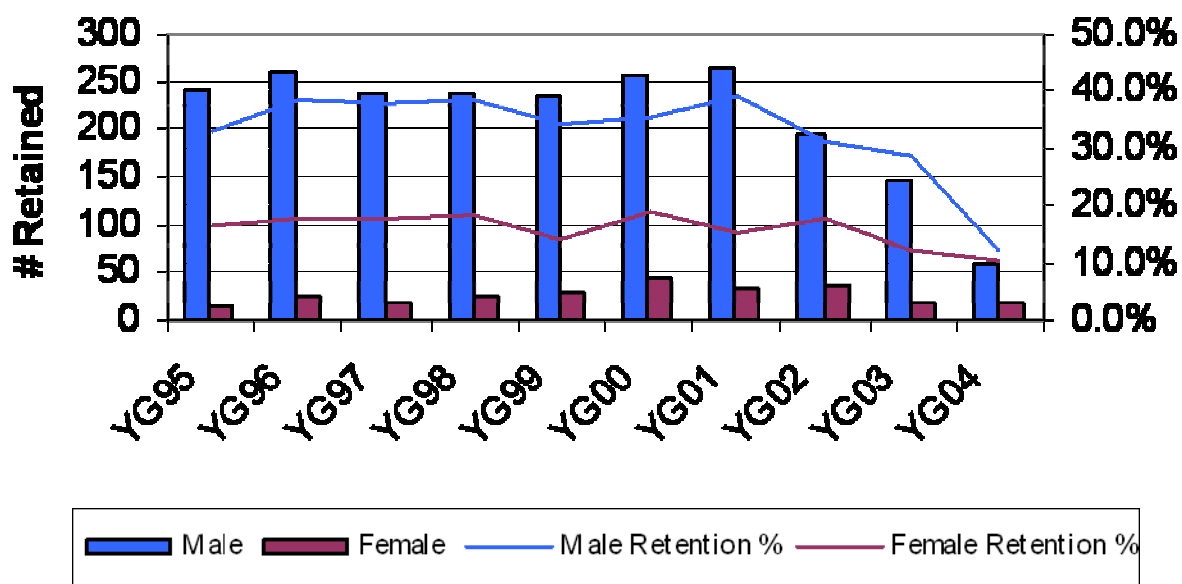


Figure 10. Gender Differences in SWO Retention by Year Group
(Adapted from Commander Naval Surface Forces, 2008b, p. 17)

Figure 10 suggests that the male SWO retention rate has been almost double the female rate for YG95 through YG01. This trend in retention reduces the diversity of the SWO population at more senior ranks, as fewer female SWOs are available for department head and more senior job assignments. Crawford et al. (2006) argue that female SWOs are more likely to leave the Navy due to family needs, such as wanting to have children. “They feel that they must choose between family and career,” thereby negatively influencing their intention to retain in the SWO community (Crawford et al., 2006, p. 13). Even the work load during SWO shore duty is not conducive to family life, as many SWOs work long hours (Crawford et al., 2006).

To combat this gender difference in retention rates between men and women, the Navy has considered several unorthodox solutions to the problem, such as exploring the potential impact of sabbatical leaves for SWOs (Yardley, Thie, Brancato & Abbott, 2004). Three potential sabbatical leave programs were reviewed by Yardley et al. (2004):

1. A facilitated return to service (RTS) program⁴
2. A one-year leave of absence (LOA) program⁵
3. A personal leave (PL) program⁶

Yardley et al. (2004) analyzed the three alternatives using return-on-investment (ROI) criteria to evaluate the Navy's investment (cost) and the predicted program benefits. The ROI rate was calculated by subtracting the total discounted costs from the total discounted benefits for each alternative, dividing the resulting difference by the total discounted cost, and then multiplying the result by 100 to obtain a percentage. Program costs contained administrative expenditures for implementing each program. Program benefits included increased SWO retention and decreased accession requirements to achieve the same force profile. Table 1 provides a summary of the results from the ROI models.

Table 1. ROI Model Results for Each Proposed Sabbatical Leave Program
(Yardley et al., 2004, p. 26)

	Program Benefit	Program Cost	ROI
Return to Service	High	Minimal	Positive and high
Leave of Absence	High	Low	Positive
Personal Leave	Low	High	Negative

⁴ The facilitated RTS program would allow selected officers, who have voluntarily separated within the previous two years, to return to service without going through the usual "red tape." This program would be very selective, since returning officers would count against new accessions. Also, SWOs' career clocks, for promotion and retirement purposes, would be adjusted to account for the break in service upon return. (Yardley et al., 2004)

⁵ The merit-based LOA program would allow SWOs to depart for up to one year to handle personal matters, such as pregnancy or advanced education. Officers would be contractually obligated to serve out two department head tours upon return. During the LOA, officers would not receive pay, but they would receive medical and dental benefits. Similarly to the RTS program, SWOs' career clocks would be adjusted accordingly. (Yardley et al., 2004)

⁶ The PL program increases the leave time between duty stations from 30 days to 90 days, of which the officer would contribute up to 45 days of accumulated leave, and the Navy would match the remainder. This program would be offered twice during a SWO's initial 12 years of service. During the PL period, officers would remain on active duty, receive all pays and benefits, and maintain their career clocks. (Yardley et al., 2004).

Based on the assumptions that Yardley et al. (2004) used for the ROI models, the RTS program increased SWO retention while reducing SWO accessions to yield 10 more SWOs to remain through 9 YCS. Since the program cost was minimal, the RTS program produced a large positive ROI. The LOA program produced similar results, but the program costs were slightly higher due to extra expenditures for medical and dental benefits during the LOA period. The PL program was predicted to have little effect on SWO retention, and it would incur higher costs since the Navy would match up to 45 days of leave while continuing to pay for officers' pay and benefits. Yardley et al. (2004) also conducted a sensitivity analysis for each alternative to test for changes in the ROI models' assumptions. These analyses yielded similar results within a relevant range of assumptions.

3. Lateral Transfer to Other Officer Communities

In addition to leaving the Navy during ports of exit, Surface Warfare Officers also have the opportunity to lateral transfer to other officer communities at various points in their career path. According to the Director of Manpower, Personnel, Training, and Education Policy Division (2007c), the requirements for eligibility to lateral transfer from the SWO community include:

- Must have respective year group authorized by the lateral transfer board precept.
- Must have completed at least 24 months of active commissioned service.
- Must have qualified as a Surface Warfare Officer (i.e., earned SWO pin).
- May not be under orders to Department Head School at SWOS.
- Must be within one year of satisfying the SWOCP obligation, the Junior SWO CSRB, or the SWO Critical Skills Bonus.

Though officers who transfer to other communities still retain in the Navy, these officers are a loss to the SWO community since they no longer fill SWO-designated

billets at sea and on shore duty. Figure 11 displays the number of annual lateral transfers by unrestricted line officer community from 1986 through 2002.

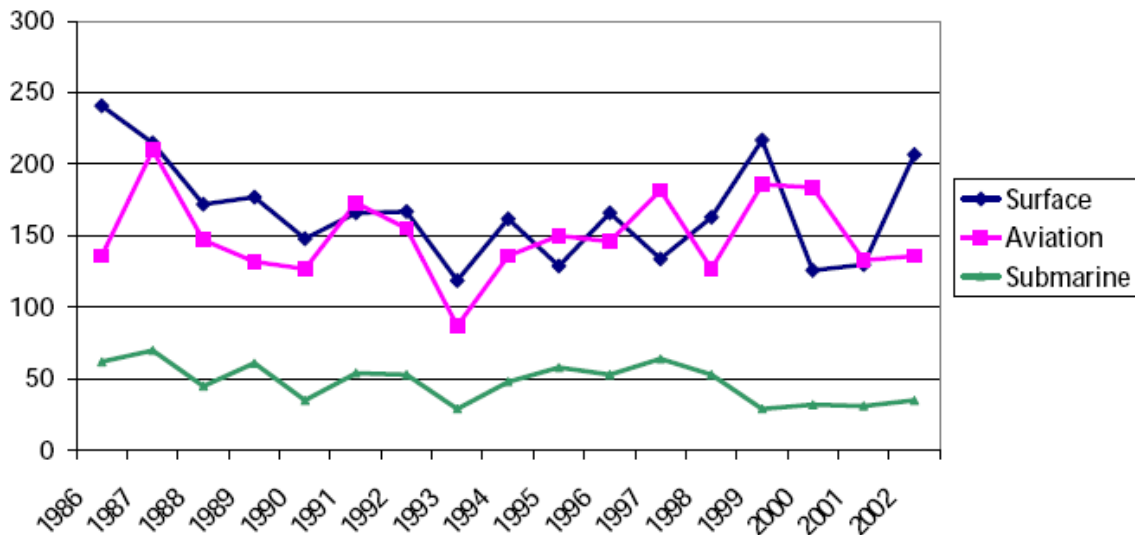


Figure 11. Lateral Transfers by Unrestricted Line Officer Community
(Monroe & Cymrot, 2004, p. 7)

Figure 11 suggests that approximately 125 to 250 Surface Warfare Officers laterally transfer to other officer communities each year (Monroe & Cymrot, 2004). This loss to the SWO community is reflected in the SWO inventory. Though the Navy wants to ensure a good officer-occupational fit for each naval officer and encourages lateral transfers as a vehicle for achieving this fit, approving a large annual allowance for lateral transfers drains the ability of the SWO community to meet OPA obligations. Additionally, due to the lack of lateral entry into the SWO officer ranks, Surface Warfare Officer accessions must be adjusted to meet the Navy's requirement for at least 275 new SWO department heads each year (Monroe & Cymrot, 2004).

4. Retention of "High-Quality" Surface Warfare Officers

Confounding this personnel retention dilemma is a concern that the Navy is not retaining high-quality officers, as it is unclear if the officers who retain at each port of exit are of the requisite caliber. Retention bonuses and special pays are non-discriminatory systems, in which officers meeting the minimum qualification requirements and applying for incentive pays are selected with few reservations. Without

a performance mechanism during the screening process, these retention bonuses and incentive pay programs do not ensure that the best-qualified officers are retained. Also, these programs are not flexible to changing labor market conditions. If more officers retain than were anticipated due to a worsening civilian job market, the Navy may be slow to react in changing the bonus program. Once mandated, these monetary programs are viewed as entitlements rather than as incentives. Additionally, retention bonuses only affect those officers at the margin of a stay-or-leave decision (Asch & Warner, 2001). Officers who are strongly opposed to staying in the Navy will want to charge the Navy exorbitant economic rents in order to retain. It is not cost effective for the Navy to retain officers with such preferences. However, it is possible that these officers are the high-ability and highly productive leaders the Navy needs to retain.

a. Defining Quality Performance

How does the SWO community define the quality of an officer? Throughout Surface Warfare Officers' careers, quality is an amorphous concept that changes as officers advance in rank. Generally, the promotion board determines the quality of an officer. However, several indicators of a quality rating exist among SWOs: qualifications, subspecialty (SSP) codes, graduate education, Joint Professional Military Education (JPME), and documented performance in an officer's fitness report (FITREP).

(1) SWO Qualifications. When SWOs complete warfare qualifications, an additional qualification designation (AQD) entry is annotated in their officer service records. AQD entries represent an officer's personal qualifications history and (to some degree) performance and quality. Certain AQDs are required to fulfill specific job positions. For example, the SWO qualification AQD is required for SWO DH billets. Officers are expected to attain the requisite AQD, but those who achieve AQDs beyond the actual job requirements and exceed expectations for their peer group exhibit high-quality characteristics.

The performance requirement for the first DIVO assignment includes: attaining Officer of the Deck Underway (OOD U/W) and SWO qualifications. These requisite qualifications begin a career filled with peer competition in which

“sustained superior performance at sea and proven leadership positions in shore or joint assignments” are evaluated and rewarded through promotion and eventual selection to command (Commander Navy Personnel Command, 2007a, p. 6). Attaining additional SWO qualifications, such as Engineering Officer of the Watch (EOOW) during the first DIVO tour, enables officers to stand out among their peers. During the second DIVO tour assignment, SWOs are expected to obtain EOOW qualifications and, if permitted by their commanding officer, Tactical Action Officer (TAO) qualifications. If the EOOW and TAO qualifications are not achieved during DIVO tours, officers are required to complete them during their first DH tour at sea. Additional warfare AQDs are awarded for qualification at additional watch stations, such as anti-submarine warfare evaluator or AEGIS missile system operator. Finally, mid-grade and senior SWOs screen for XO and CO command, which includes respective AQDs that define quality among their peers.

(2) Subspecialty (SSP) codes. During shore duty, Surface Warfare Officers have the opportunity to enhance their personal qualifications by attaining subspecialty (SSP) codes. SSP codes identify an officer’s achievements in enrolling and completing “advanced education, functional training, and significant experience in various fields and disciplines” (Commander Navy Personnel Command, 2008b, p. 1). As such, SSP codes can be awarded for both education and experience within a specific specialty field. For example, 3130X is the SSP code for manpower systems analysis management, where the suffix (placeholder is X) represents the level of qualification based on experience and education. Certain SSP codes provide further detailing opportunities that are not provided to non-designated officers, thereby providing additional means to separate quality from non-quality SWOs. (Director of Manpower, Personnel, Training, and Education Policy Division, 2007b)

(3) Graduate Education. Assignments to duty locations such as the Naval Postgraduate School (NPS), United States Naval Academy (USNA), and Naval Reserve Officer Training Commands (NROTC) provide the opportunity to attain a Master’s Degree and higher education at a Navy-sponsored residence program. Officers can also choose to enroll in Navy distance-learning education programs. Finally, SWOs can enroll in residence or distance-learning programs through civilian institutions of their

choice, funded by Tuition Assistance, the *Montgomery GI Bill*, or personal funds. These programs are also documented in officers' personnel records by SSP codes by which the Navy "track[s] specific skill sets beyond those described by an officer's designator" (Commander Navy Personnel Command, 2008b, p. 1). Obtaining advanced education represents a higher-quality officer.

(4) Joint Professional Military Education (JPME). Through residence courses and distance-learning programs, SWOs have the opportunity to complete joint-military education in two consecutive phases: JPME Phase I and JPME Phase II. In addition to significant joint experience, completion of both phases is required to earn a Joint Qualified Officer (JQO) designation. JPME Phase I, JPME Phase II, and the JQO designation are all quality indicators for Surface Warfare Officers, as they indicate a level of joint-military expertise that is highly valued by the Navy. (Office of the Secretary of Defense, 2007).

(5) Documented Performance in a SWO's FITREP. Since the nature of the FITREP process includes relative performance scores based on comparison to an officer's peer group, FITREP scores and promotion recommendations are instrumental in gauging the quality of an officer. Appendix B contains a sample of an officer FITREP, including the criteria against which SWOs are evaluated.

b. Definition of Quality Changes with Rank

During department head, XO, CO, and major command tours, qualification requirements and expectations continue to develop as more stringent standards apply to future job positions. As compiled from the FY08 SWO community brief, Figure 12 shows the descriptive statistics for SWOs at each rank from Lieutenant (O-3) through Captain (O-6).

CATEGORY	O-3	O-4	O-5	O-6
OFFICER INVENTORY	2591	1111	839	406
MASTERS DEGREE	18.4%	60.5%	84.5%	92.6%
NUCLEAR QUALIFIED	15.1%	8.7%	8.8%	13.3%
JPME PHASE I	7.6%	32.1%	70.6%	86.7%
JPME PHASE II	0%	1.7%	27.1%	59.9%
JOINT DUTY ASSIGNMENT	0%	3.4%	27.4%	66.7%
JSO	0%	0.3%	10.8%	42.4%
FINANCIAL MANAGEMENT	2.1%	3.0%	4.3%	9.4%
OPERATIONS ANALYSIS	1.2%	5.2%	1.8%	6.4%

Figure 12. Surface Warfare Officer Qualifications and Education Statistics
(Adapted from Commander Navy Personnel Command, 2007a, pp. 3-5)

As shown in Figure 12, the quality metrics increase as rank increases. The percentage of the SWO population with Master's Degrees, JPME Phase I and Phase II qualifications, joint-duty assignments, JSO (now called Joint Qualified Officer) designation, financial management SSP code, and operations analysis SSP code increases as SWOs progress through the ranks. Increasing attainment rates in graduate education, AQDs, and SSP codes detail the value that the SWO community and selection boards place in these areas. For example, in differentiating the quality of officers, the percent of O-4 SWOs who completed JPME Phase I are recognized over those officers who did not complete this milestone, 32 percent compared to 68 percent. At the Captain (O-6) level, a senior SWO among the 13.3 percent who did not complete JPME Phase I is differentiated negatively from the others. The same analysis can be made for other quality indicators.

5. Dissatisfaction with Compensation as a Reason for Leaving

Regardless of the quality of officers who leave, it is hypothesized that SWOs are leaving for very specific reasons. One reason consistently repeated in the literature is

dissatisfaction with the current compensation system. Several recent surveys and other studies have captured these reasons and are the grounds for further analysis and policy implications.

a. 2000 Military Exit Survey

The Defense Manpower Data Center (DMDC, 2001) conducted the 2000 Military Exit Survey in accordance with the *Fiscal Year 2000 National Defense Authorization Act*. DMDC (2001) distributed over 113,000 questionnaires, leading to 15,952 responses from service members in the Army, Navy, Marine Corps, Air Force, and Coast Guard, who were leaving active duty between April 1, 2000, and September 30, 2000 (though the Coast Guard's period began July 1, 2000). Among all respondents, officer and enlisted, the top reason cited for leaving active-duty service was pay and allowances—41 percent of the responses (DMDC, 2001). However, officers selected overall job satisfaction as their top choice, with 44 percent of the responses (DMDC, 2001). According to DMDC (2001), the top two factors of military life that would have to be improved to encourage officers to stay were the quality of leadership (30 percent of the responses) and basic pay (21 percent of the responses). Finally, 48 percent of the entire sample was dissatisfied with basic pay. However, officers were more likely than enlisted members to be satisfied with basic pay. One weakness of this survey was that the results were not reported by different services and different ranks. Therefore, naval officer-specific survey results can not be extracted from DMDC's (2001) report.

b. 2004 SWO Continuation Intentions Quick Poll

Since the SWO community has difficulty retaining mid-grade officers, the 2004 SWO Continuation Intentions Quick Poll was administered by the Navy Personnel Research, Studies, and Training Department (NPRST). The poll was sent to 4,448 junior and mid-grade Surface Warfare Officers (O-1 through O-4), producing 2,128 responses (NPRST, 2004). According to NPRST (2004), mid-grade (O-4) and prior-enlisted SWOs were more likely to remain in the Navy than junior SWOs (O-1 through O-3). Additionally, "loyalty, patriotism, benefits, job security, and educational benefits" were

the top reasons for remaining in the Navy (p. 1). Finally, the poll found that an increase in the Surface Warfare Officer Continuation Pay (SWOCP) retention bonus payout would increase the participants' intention to retain, likely increasing the overall retention rate as well (NPRST, 2004).

c. 2005 SWO Junior Officer Survey

To further examine the pulse of the surface warfare community, the 2005 SWO Junior Officer (JO) Survey was administered to 6,411 SWOs (O-1 through O-5) and completed by 1,803 respondents (Department of the Navy, n.d.). Participants chose the following options as satisfiers, with the percentage of responses in parenthesis: leading and training subordinates (88 percent), relationship with peers in the wardroom (83 percent), leadership challenge using skills and abilities (79 percent), mental challenge using skills and abilities (75 percent), and relationship with senior enlisted (72 percent) (Department of the Navy, n.d.). Respondents also selected the following choices as dissatisfiers: ability to plan and schedule family and personal activities (58 percent), hours of work required (48 percent), ability to plan and schedule work (42 percent), inspections (40 percent), and the zero-defect mentality (27 percent) (Department of the Navy, n.d.). It is unclear whether participants were provided questions pertaining to basic pay or the military pay system; nevertheless, participants were asked to rate the level of motivation to retain provided by two retention bonuses—SWOCP and Junior SWO CSRB (Department of the Navy, n.d.). These recent responses are displayed in Figure 13 and Figure 14, along with past responses from previous surveys.

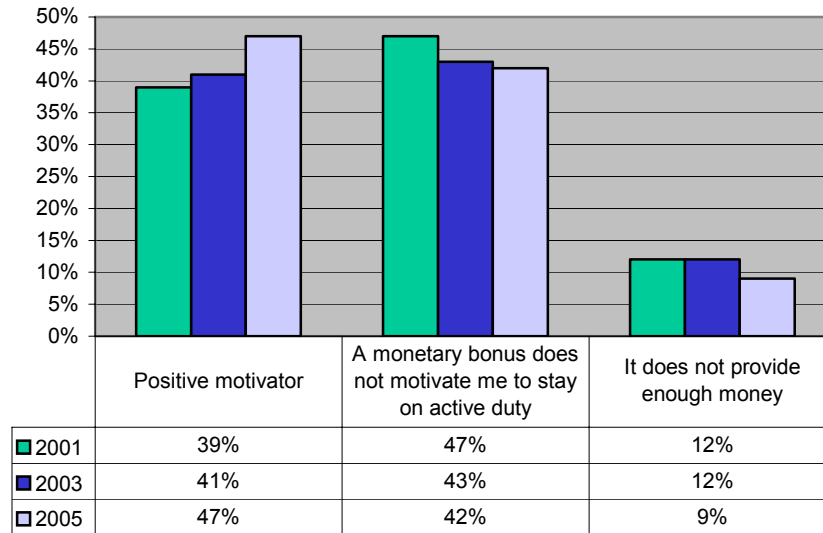


Figure 13. Level of Motivation that SWOCP Provides to the Retention Decision among SWOs
(US Department of the Navy, n.d., p.15)

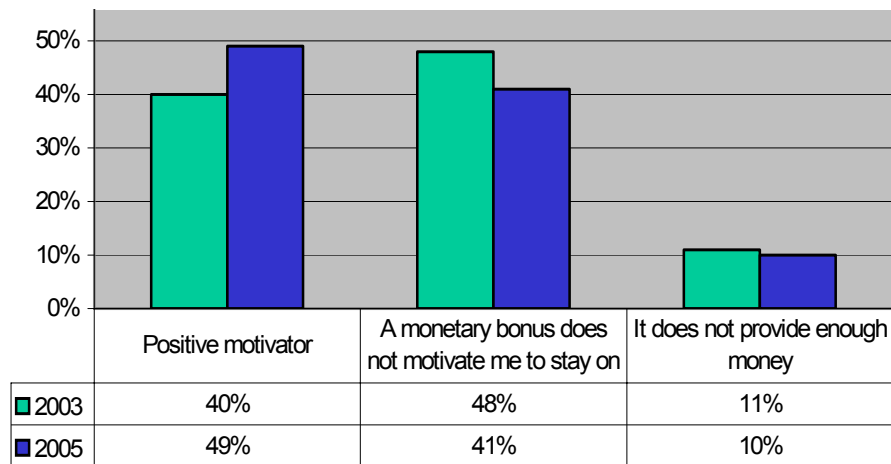


Figure 14. Level of Motivation that Junior SWO CSRB Provides to the Retention Decision among SWOs
(US Department of the Navy, n.d., p.15)

These results may be skewed due to the seniority of the officers polled. Commanders are not junior officers, and they have a much different outlook on the surface warfare community than do more junior officers. Additionally, they were not offered either of the bonuses, since SWOCP and the Junior SWO CSRB are recent programs. This may have forced the majority of the respondents to gravitate toward the “monetary bonus does not motivate me to stay on” option.

d. August 2005 Status of Forces Survey of Active-Duty Members

The Defense Manpower Data Center (DMDC) conducted the 2005 Status of Forces Survey of Active-Duty Members between August 22, 2005, and September 27, 2005 (DMDC, 2006). The survey was administered in a web-based format to 35,000 active-duty personnel, in order to determine their status and intentions. The survey included everything from retention and factors influencing a service member’s retention decision to health care and length of medical clinic wait times. Most striking were the responses regarding military compensation, military-to-civilian job comparisons, and the balance of work life and home life.

Although 60 percent of the Navy sample surveyed reported overall satisfaction with the “military way of life,” the poll indicated an overall decreasing trend since July 2002 (DMDC, 2006, p. 35). As Figure 15 depicts, the average satisfaction level of all services members with their level of compensation was even lower (47 percent), while the Navy maintained a 50-percent satisfaction level (not shown in Figure 8). The overall service trend of decreasing satisfaction started in April 2004. (DMDC, 2006)

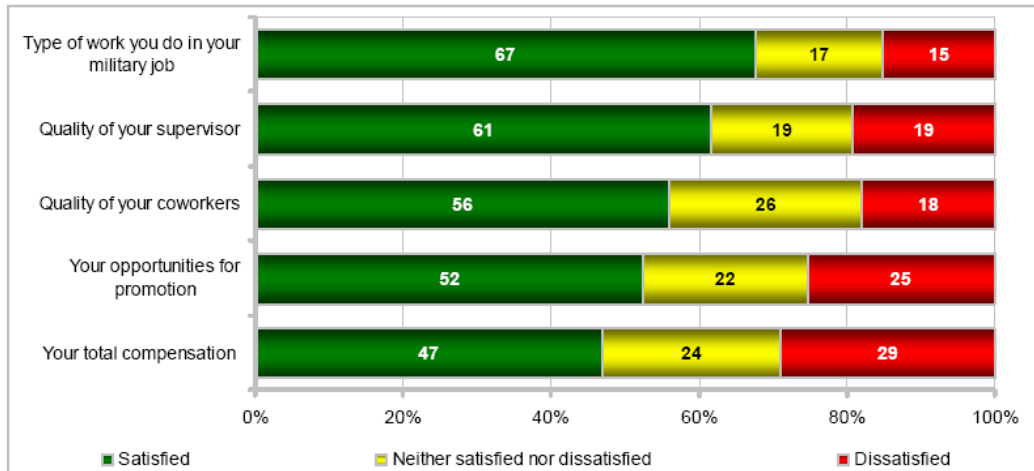


Figure 15. Satisfaction Aspects of Military Service for all Service Members (DMDC, 2006, p. 39)

Comparing military-to-civilian employment (see Figure 16), while over 60 percent of the respondents were satisfied with retirement benefits and vacation time, only 35 percent of the service members were satisfied with spouse programs that included education, training, and career opportunities; total compensation; and promotion opportunities.

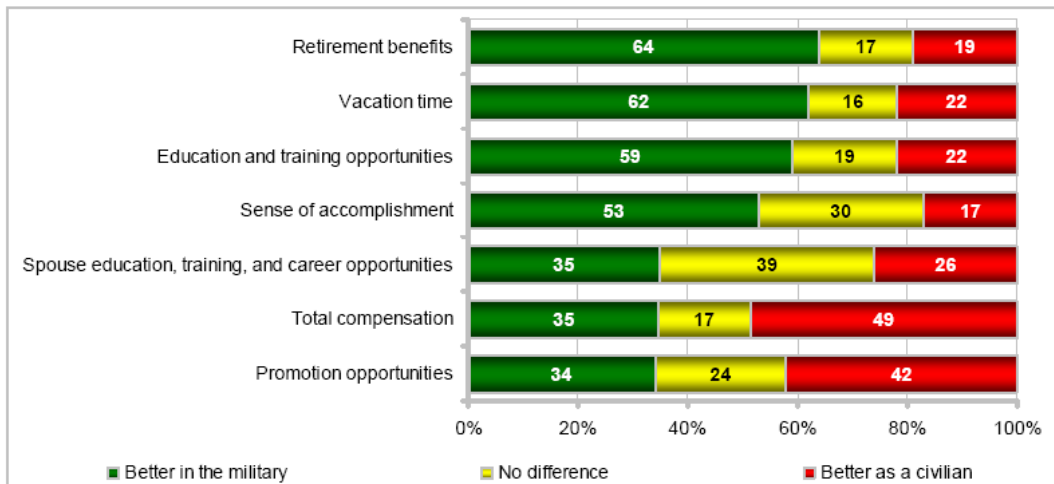


Figure 16. Comparison of Military to Civilian Opportunities (DMDC, 2006, p. 337)

Even more disconcerting is that nearly 70 percent of respondents reported dissatisfaction with hours worked per week and the amount of, or lack of, family time (DMDC, 2006). Lastly, an astounding 85 percent of service members responded that increased pay would improve their work-life balance (DMDC, 2006). Figure 17 clearly displays the impact of certain employment-related aspects and support mechanisms on service members' quality of life.

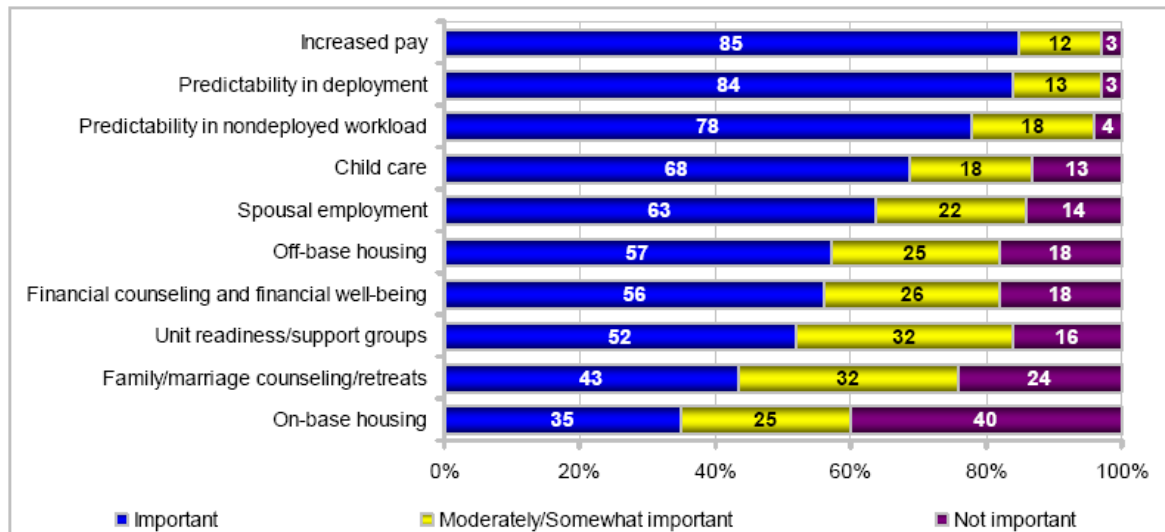


Figure 17. Importance of Factors in Improving Work-life Balance (DMDC, 2006, p. 358)

e. Other SWO Retention Surveys

Using a survey sample size of 334 junior SWOs, Wahl and Singh (2006) asked respondents to rate several statements on their influence in the decision to retain at two critical career points: after the minimum service requirement (MSR) and at the current port of exit. Some of the 14 choices influencing retention at the first critical career point were the Global War on Terrorism, the current state of world instability, the economy and job market, SWOCP, marital status, the influence of SWOCP on spouse, amount of take-home pay, increases in pay and housing allowances, medical benefits, education, retirement benefits, the lifestyle, job satisfaction, and an “other” category (Wahl & Singh, 2006, p. 29). The 10 items at the current port of exit include: take-home

pay, bonus pay, medical benefits, education, retirement benefits, patriotism, prior SWO job satisfaction, promotion, operation tempo (OPTEMPO), and an “other” category (Wahl & Singh, 2006, p. 29).

Wahl and Singh (2006) found that retirement benefits and job satisfaction had the greatest influence on officers’ decisions to retain after their MSR, while retirement benefits and patriotism had the largest impact on current retention. At the first port of exit, the “influence of SWOCP ranked fifth out of 14” for the overall SWO sample, and when separated for females only, SWOCP ranked eighth out of 14 (Wahl & Singh, 2006, p. 30). Similarly, at the current port of exit, the “influence of SWOCP ranked sixth out of 10” for the overall sample, and for females SWOCP ranked ninth out of 10 (Wahl & Singh, 2006, p. 32). Based on these survey results, SWOCP only had a marginal impact on the decision to retain at the first and most current ports of exit for the junior SWOs questioned.

Similarly, after conducting several focus groups and interviews with both junior and senior Surface Warfare Officers, Crawford et al. (2006) concluded that “[n]one of the women or men in the study were influenced to stay by the SWOCP” (p. 16). Additionally, money appears to influence the retention decision of male SWOs more than female SWOs (Crawford et al., 2006). However, Crawford et al. (2006) also recognize that SWOCP is correlated with an increase in overall SWO retention over the past few years, as is indicated in Figure 18.

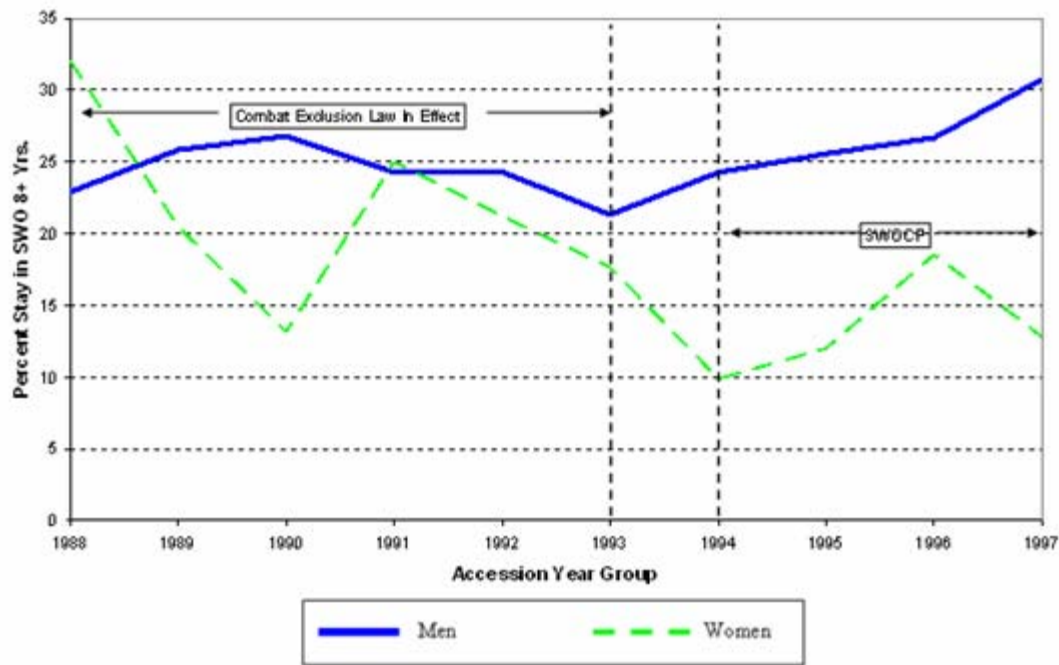


Figure 18. Effect of SWOCP on SWO Retention for YG94 through YG97 (Crawford et al., 2006, p. 28)

According to Figure 18, the eight-year retention rate for both male and female SWOs in YG94 through YG97 has increased since the introduction of SWOCP. Though this depiction does not prove causality, it suggests correlation.

f. Weaknesses of Survey Data

Although surveys are good tools for gathering information, they have several flaws which need to be addressed. First, surveys collect self-reported data, which can be inaccurate if the participant feels pressure or is afraid to be truthful. This type of inaccuracy is unlikely in the 2000 Military Exit Survey as officers leaving active duty have less fear about reprisal. However, the officers polled in the 2005 SWO JO Survey and the August 2005 Status of Forces Survey were on active duty and may have been concerned about the confidentiality of their responses. Second, surveys only capture intentions, not actual behavior, and intentions are subject to change. For example, the

2000 Military Exit Survey asked “what would have to be improved so they would stay” (DMDC, 2001, p. 11). Answers merely provided a proxy to represent intentions if such changes were enacted. Third, surveys are generally restricted to broad categories of respondents, in which little personal information is collected. This makes it nearly impossible to merge personnel files with survey responses for a comprehensive data set to conduct analysis. In addition, exit surveys are obtained from a very select group—those who leave. Their responses, therefore, cannot be representative of the entire population.

g. Analysis of Factors Affecting the Retention Plans of Junior Navy Officers

Clemens (2002) analyzed survey data using a multivariate logistic regression model. Data from the 1999 Department of Defense Survey of Active Duty Personnel was used to model the effect of demographic characteristics, rank, experience, economic factors, military occupation, and satisfaction characteristics on the probability of intent to stay in the Navy (Clemens, 2002). An independent variable that captured satisfaction with military pay and promotion was used. Unfortunately, the partial effect of this variable was not statistically significant at even the 10-percent level. This discrepancy may be due to combining promotion, advancement, pay, retirement, and security factors into a single categorical variable. The different factors should have been separated to yield the partial effect of each characteristic. However, other motivational factors, such as satisfaction with military work values and satisfaction with military time allocation, were found to have positive effects on naval officer retention (Clemens, 2002).

6. Annualized Cost of Leaving (ACOL) Model

a. Methodology of the ACOL Model

In 1984, Warner and Goldberg developed a theoretical model quantifying a service member’s retention decision. Using FY74 and FY78 data from the Defense Manpower Data Center (DMDC) containing personnel history on over 220,000 enlisted

personnel in 80 ratings, Warner and Goldberg (1984) estimated a value for the decision process. When approaching career crossroads, service members must weigh their options by determining the utility of remaining in the service to n years. The following equation describes the annualized cost of leaving (ACOL) model, where A_n is annualized cost of leaving; C_n is the cost of leaving, representing the difference between the present value of military life and civilian life; d^j denotes the present value of a dollar received j years in the future; and $(\gamma_c - \gamma_m) = \gamma$ is the net taste of civilian life over military life (Warner & Goldberg, 1984). The following is the equation for the ACOL model:

$$A_n = C_n / \sum_{j=1}^n d^j > (\gamma_c - \gamma_m) = \gamma$$

When the annualized cost of leaving exceeds the net taste of civilian life, it is more costly to leave military service, and the service member should elect to remain in the service. If the net taste of civilian life exceeds the individual's ACOL, then the reverse is true.

Hansen and Wenger (2005) revised the ACOL model developed by Warner and Goldberg. They used two data sources to complete their study—CNA Corporation's Navy data from the *Enlisted Master Record* and the *March Current Population Survey* covering FY87 through FY99. They included two assumptions in their model. First, Hansen and Wenger (2005) assumed military members aggregate all of the elements of pay into a single number and are able to compare that value to civilian compensation. Second, by using pay over time, the revised ACOL model reveals a time “horizon” over which relative earnings can be compared (Hansen & Wenger, 2005, p. 32). Hansen and Wenger's (2005) version of the ACOL model is defined as:

$$ACOL_y \equiv \sum_{i=t+1}^{t+y} \frac{\frac{(M_i - C_i)}{(1+r)^{i-t}}}{\sum_{i=t+1}^{t+y} \frac{1}{(1+r)^{i-t}}} > \tau$$

This model indicates that members at year t of their career have two choices: to stay for y additional years or get out. Service members will stay as long as the

difference between their military compensation, M_i , and civilian compensation, C_i , adjusted by the real discount rate, r , exceeds their relative taste for civilian life (Hansen & Wenger, 2005). An individual will stay as long as “there is at least one time horizon over which [the above equation] is satisfied” (Hansen & Wenger, 2005, p. 32).

b. ACOL Model for Surface Warfare Officers

Crayton, Darling, and Mackin (2002) employed a panel probit model using the ACOL framework to study the effects of pay elasticity on retention decisions of Surface Warfare Officers at seven critical decision points. The sample included over 14,000 non-nuclear SWOs, who made retention decisions between 1979 and 2000. For each decision point, the mean years of commissioned service (YCS), mean age, and pay elasticities derived from the probit model are depicted in Table 2.

Table 2. Pay Elasticity of SWO Retention Decisions at Critical Ports of Exit
(Adapted from Crayton et al., 2002, pp. 9-14)

Decision Point	Mean YCS	Mean Age	Pay Elasticity
1	4.8	28.8	0.748
2	5.1	29.0	0.525
3	6.4	30.2	0.401
4	7.6	31.4	0.246
5	8.8	32.7	0.138
6	9.8	33.8	0.133
7	10.7	34.7	0.098

The pay elasticities at each decision point were derived from the ACOL independent variable in the probit regression model, which was statistically significant at the 1-percent level. The first decision point captures the minimum service requirement for SWOs, which has a pay elasticity of 0.748 (Crayton et al., 2002). As tenure increases, the pay effects rapidly decrease. Additionally, though not depicted in Table 1, SWOCP

was found to increase the retention probability at MSR by over 15 percent (Crayton et al., 2002). However, the results of the model may be limited due to the range of years over which retention decisions were made. Other factors associated with time-specific trends should have been analyzed. For example, naval officer retention may have been significantly affected after the terrorist attacks on September 11, 2001, when compared to earlier periods. These unobserved effects were probably buried in the error term in the regression model.

E. FACTORS INFLUENCING RETENTION

1. Human Capital

“Education and training are the most important investments in human capital” (Becker, 1992, p. 85). As an organization, the Navy operates within the same human capital constraint as any other institution. Both are dependent on sufficiently trained and experienced labor. For the active-duty Navy, this labor force consists mainly of the officer and enlisted corps, of which the Surface Warfare Officer community is a key component.⁷ Their human capital is the sum of the knowledge obtained through training and experience (before and during active-duty service), inherent ability, and creativity (McShane & Von Glinow, 2007).

According to Ehrenberg and Smith (2006), business organizations and individuals engage in three types of human capital investment: education and training, migration (relocating for better job opportunities), and job search. With the exception of firm-specific training costs, civilian institutions generally pass this investment expense onto employees, whereas the Navy bears practically 100 percent of the expense for newly commissioned SWOs (not counting Bachelor’s Degrees for OCS accessions) and nearly 100 percent later in an officer’s career. To train and retain an effective fighting force, the military services must also pay sufficient wages to “compete for the skilled labor that they themselves have created” (Rosen, 1992, p. 232). When civilian employers engage in

⁷ Government Schedule (GS), Senior Executive Service (SES), and government employees under the National Security Personnel System (NSPS) comprise additional labor for the Department of Defense, including those assigned to Navy positions.

human capital investment, they seek a return on their investment through increased worker productivity, lower wages compared to what the post-trained worker may be able to receive elsewhere, and a commitment from the employee until the employer recoups its investment (Ehrenberg & Smith, 2006). While naval officers may incur additional service obligations, some officers are able to serve such obligations concurrently with existing service commitments. This provides economic rents to these service members and a relatively minimal return on investment for the Navy. Furthermore, human capital training investment does not have an immediate impact on individual promotion opportunities, annual pay, or even retention. The first two officer promotion steps occur systematically with time in service and depend little on performance measures. Not until advancements reach beyond the rank of Lieutenant (O-3) are promotions based on individual performance and human capital growth, in addition to previously mentioned time metrics. Thus, in many ways, the Navy cannot determine the long-range effects of human capital investments.

Ehrenberg and Smith (2006) describe three costs associated with investment in human capital, each falling under the categories of either specific or general training. These costs are direct expenses, lost earnings, and psychic losses.⁸ Education and training raise the employee's ability to increase earnings and also improve productivity through knowledge, skills, and analytical ability (Becker, 2002). While psychic costs are commonly associated with training and education in both the civilian and military sectors, SWOs benefit from specific and general training conducted during the standard workday, which decreases these costs.

During a Surface Warfare Officer's career, it is common to accumulate several years in training commands. The more technical the billet, the longer a SWO spends in training programs. For example, SWOs spend at least six months in training at Department Head School before reporting for their first DH tour. Additionally, combat

⁸ Direct costs include the cost of education and training. Lost earnings occur as a result of time spent not working while enrolled in a program. Psychic costs are intangible costs associated with mentally challenging or tedious programs. General training encompasses work skills that apply to many employers, while specific training is focused on enhancing skills that will benefit the employer providing the specific training. (Ehrenberg & Smith, 2006)

systems jobs aboard AEGIS destroyers require several months of AEGIS missile system training before reporting aboard. Furthermore, as SWOs progress through rank, an assignment to advanced education at one of several War Colleges or the Naval Postgraduate School may again remove them from standard Surface Warfare Officer duties—lasting from ten months to over two years. Meanwhile, these officers receive full salary and benefits and pay nothing in tuition and direct expenses. Other Navy-sponsored education programs such as the Executive Master of Business Administration Program or enrollment in local or online universities may require weekday, evening, and weekend coursework while officers remain in an operational billet. Though naval officers pay for some of these programs, tuition assistance and the *Montgomery GI Bill* (depending on the commissioning source) are available to alleviate the burden of direct expenses for the officer.⁹ These programs allow SWOs to build human capital while on active duty and minimize the financial burden which typically coincides with psychic costs associated with returning to an academic environment.

In addition to education and training, migration and job search are built-in components of military service. Though some job moves may be only lateral transitions with little increase in human capital, many more aim at advancing officers' careers, enabling them to become more experienced while filling critical billets. These job changes are coordinated through the assistance of placement officers and detailers, who serve as career planners helping to fill jobs with qualified officers while ensuring officers remain upwardly mobile. They balance the needs of the Navy with officers' career development. As with education and training, the Navy pays for job changes requiring a permanent change of station, while some members may actually earn money for the job relocation. Instead of job mobility coming at the expense of an individual, in some cases

⁹ Tuition Assistance (TA) is the Navy's educational financial assistance program providing active-duty personnel funding for tuition costs for courses taken in an off-duty status at a college, university or vocational or technical institution (Navy College Program, 2007). Navy TA pays for a fiscal year credit limit of 16 semester hours, 24 quarter hours, or 240 clock hours per individual up to a \$4500 per fiscal year (Navy College Program, 2007). MGIB provides up to 36 months of education benefits and more than \$37,000 to eligible active-duty service personnel and veterans (Department of Veteran Affairs, 2004).

the Navy even provides individuals a financial incentive for their job relocation. It is evident the military invests significantly in all three aspects of human capital: education and training, migration, and job search.

As the Navy's total force structure maintains approximately 51,000 officers, human capital expectations have become more extensive in order to achieve upper-level promotions. Command selection board precepts—which set priorities for screening commanding officers to lead squadrons, ships, and other units—brief the growing importance of expanding human capital investments in education. Training in JPME and a Master's Degree are becoming standard qualifications. Although advanced degrees are not necessary to promote to the rank of Commander (O-5), promotion beyond this level is becoming increasingly difficult without them. Separating “best qualified” personnel from “fully qualified” personnel, selection boards give favorable consideration to investments in human capital through military education, graduate degrees, and subspecialty codes (Secretary of the Navy, 2007a, p. B-1). Those officers who have achieved additional development, above and beyond their contemporaries, tend to compete more successfully than the rest of the candidates (Secretary of the Navy, 2007a).

Throughout a SWO's 20-year career, he or she receives specific training and general training, may change jobs six or seven times (often in as many locations, both ashore and at sea), and coordinates job moves through detailers and placement officers. With exception to individually selected education programs, each investment in human capital occurs during government time and at the government's expense. Minimal financial expense is passed to the officer. Though civilian companies may offer larger salaries for upper-level management, Navy compensation and human capital investments coupled with motivation, extrinsic, and intrinsic factors influence officers' decisions to serve past their MSR and remain in the service (Baker, Gibbs, & Holmstrom, 1994a).

2. Human Motivation

Research in the area of human motivation is incomplete without reference to “Maslow's Needs Hierarchy Theory” (McShane & Von Glinow, 2007, p. 92). Individual motivation stems from basic needs. As the necessities of food, water, and shelter are

fulfilled, the next higher order of needs are sought after and achieved (Steininger, 1994; McShane & Von Glinow, 2007). However, employment and retention with employers extend far beyond a paycheck and satisfying basic needs. Today's work force desires to make a positive impact with the work it performs. While military members do not work for free, the compensation and financial incentives provide merely a portion of the motivation for a naval career (Strickler, 2006). The complicated concept of motivation and retention is further explained by Rabin (2006) as a "mix of both self-interested motives and social preferences" (p. 450).

Military service in the 21st century is much different from other periods in US history. The Defense Advisory Committee on Military Compensation (DACMC) summarizes today's service members succinctly:

The men and women who serve in the US military are there through voluntary decisions to enter and remain in the military service, not through the coercion of conscription. It is the innate ability, training, experience, and motivation of the men and women who staff this force that are the primary reasons for its superb capabilities. (DACMC, 2006, p. XV)

In a *Washington Post* article, General Sheehan, USMC (Ret.), stated that "service to the nation is both a responsibility and an honor for every citizen presented with an opportunity" (2007, p. A17). As previously discussed, naval officer compensation involves basic pay, allowances, incentives (that are designed to retain officers at critical points during their careers), and a generous retirement pension plan. Norman (1971) describes the decision process of a making the military a career as a function of:

geographical background, family consideration, family economic background, promotion opportunities, retirement benefits, travel, job satisfaction, source of commission, educational opportunities, social opportunities, effectiveness of supervisor, use of abilities, freedom of expression, housing situation, family separation, changing fringe benefits, job security, prestige, like military life, stability of tours, and feeling of nationalism. (p. 14)

Norman (1971) reported that service members "cite[d] increased pay, faster promotions, and higher prestige in order of importance toward making military service more attractive" (p. 15). Analyzing the most important aspects of military service,

younger officers reported such intrinsic qualities as military way of life, family considerations, and opportunity to use abilities; while more senior officers cited military retirement and military lifestyle as the two most important components of military service (Norman, 1971). Though Norman's study is dated, these findings are supported through current officer surveys.

Success of the military depends on individuals, enlisted and officers, being able to make good decisions and lead others in making similar decisions. Surface warship commanding officers (COs) must have the utmost trust and confidence in their personnel to accomplish the mission autonomously. COs cannot remain on the bridge 24 hours a day, though they are reachable at a moment's notice. Many situations require officers entrusted to standing watch to make decisions first and inform the CO as soon as possible. Leadership and morale in the workplace flourishes when everyone participates (Wilsey, 1995). Although in many ways the military operates within the confines of a strict hierarchical system, there is freedom of action and decision-making that forms the bedrock of leadership and motivation (Wilsey, 1995).

Leadership, as described by Jago (1982), is a "process and a property" (p. 315). It may not have a set definition, but common themes consistently emerge. Jago (1982) describes leadership as the ability to influence others toward meeting group objectives. As a personal quality, leadership is a characteristic of those who successfully employ the process of guiding others. Leadership forms the cornerstone in officer motivation and is central to influencing an officer's decision to remain at ports of exit.

3. Intrinsic and Extrinsic Rewards: What Motivates Surface Warfare Officers?

Individual motivation and the reasons for serving and retaining past the minimum service requirement are interwoven with intrinsic and extrinsic rewards. What matters most to one individual may be of secondary or tertiary importance to another. How one views these matters greatly determines individual motivation and chosen interactions. Patriotism or the call to service may be the intrinsic motivator that not only drives an individual to serve in the Navy but also determines his or her dedication to that calling.

At the 20-year mark, individuals become vested. At that point, they will receive a life-long, inflation-protected pension. The job security attained after promotion to Lieutenant Commander (O-4) and the financial rewards that accompany a naval career are extrinsic qualities associated with military service, while patriotism is a major intrinsic factor.

Two Surface Warfare Officers may have completely different attachments to Norman's (1971) list of 21 military career influences. While one officer's decision to serve and retain may be related to travel and job satisfaction, another is gratified by military life and stability of tours. Each decision has intrinsic and extrinsic value to the individual. However, the most important motivators are not necessarily the same. At three different firm internal labor markets (FILM) levels, Figure 11 depicts the relationship between the organizational commitment of individuals' value of job security plotted against the level of FILM.¹⁰ Figure 12 shows organizational commitment in relation to promotion opportunity at a given level of FILM.¹¹ How individuals perceive their opportunities greatly influences their organizational work behavior and their decisions to serve.

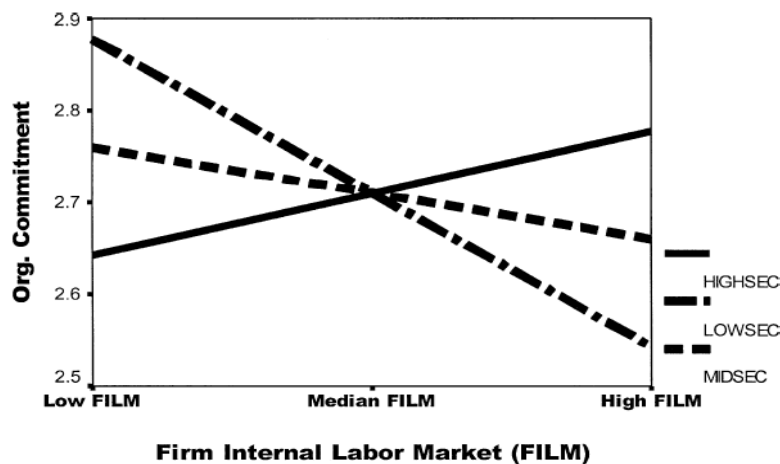


Figure 19. FILM and Organization Commitment by Levels of Job Security
(Yang, Worden & Wilson, 2004, p. 680)

¹⁰ FILM is an index level of hiring practices and promotion opportunities. A low FILM indicates external hiring practices and restricted promotion opportunity, while a high FILM denotes promotion from within and favorable promotion opportunities, as employees are home grown. Job security is a measure of one's value of job stability with the firm. (Yang et al., 2004)

¹¹ Promotion opportunity is a measure of individual perception of the likelihood of advancement opportunities within the firm (Yang et al., 2004).

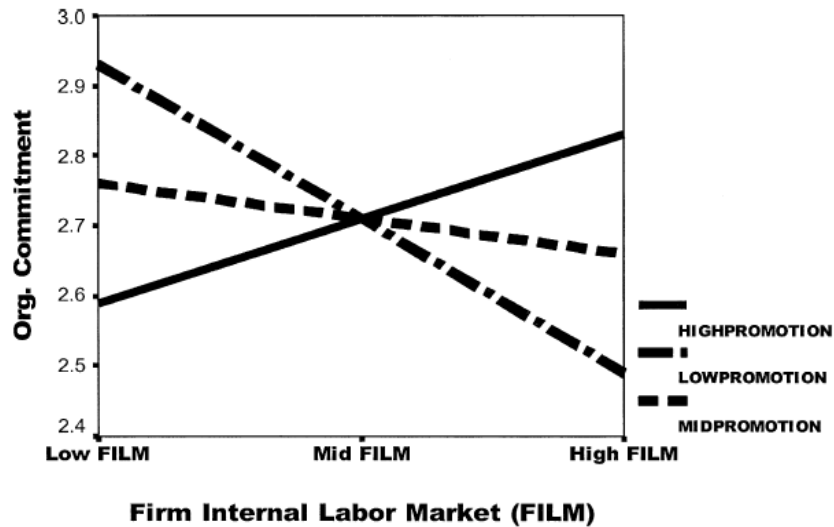


Figure 20. FILM and Organization Commitment by Levels of Promotion Opportunities (Yang et al., 2004, p. 681)

F. CHAPTER SUMMARY

Data support the challenges facing manpower planners regarding the costs and benefits associated with retaining a qualified and talented workforce. This difficulty is exacerbated in the Navy as a result of internal labor market uniqueness and its impact on recruiting, promotion, and retention of Surface Warfare Officers. The military pay structure inadvertently deters higher-level performance by promoting lower-performing SWOs at similar rates and by providing the same pay based on the criteria of time in service, without taking quality into consideration. High-quality SWOs who have external market pay information may be more susceptible to civilian market incentives, thereby increasing their probability of exiting naval service before retirement eligibility. With its inverse relationship between economic rents (as obtained through experience and investments in human capital), the military pay structure falls far short of the civilian standard. Further damage is caused by manning shortfalls at specific points along the SWO career path. These shortfalls have severe spillover effects at major career decision points for SWOs who are filling senior positions and not being compensated fairly.

Additionally, the quality of SWOs leaving at ports of exit is unclear. If a greater proportion of high-quality SWOs are leaving than are staying, the Navy may have a larger dilemma than just inventory shortfalls.

Various surveys highlight the sentiment in the fleet. While these surveys are somewhat flawed, the pulse of the respondents echo a reason for concern among policy analysts. Studies indicate problems arise with compensation, but they do not address the potential impact of a performance-based compensation system. Through regression analyses and applications of the ACOL model, evidence shows that an increase in compensation has a positive effect on retention among Surface Warfare Officers. Additionally, investments in human capital significantly influence officers' decisions at the ports of exit. The more time an officer has invested in the Navy, the more human capital the officer may possess, which can potentially attract a higher-paying civilian company to bid for that human capital. However, as SWOs invest more time in military service, the attractiveness of an inflation-protected, life-long annuity is a significantly large carrot at the end of the stick. Yet extrinsic rewards, such as present and future income streams, are insufficient stand-alone motivators used to retain a qualified and talented workforce. Nonetheless, bonus programs, such as SWOCP and the Junior SWO CSRB, have been implemented to provide stronger financial motivation to combat the SWO retention problem.

Individual motivation and intrinsic rewards also factor into naval officers' retention decisions. As reported in the aforementioned surveys, significant intrinsic factors include overall job satisfaction, quality of leadership, loyalty, patriotism, relationships with coworkers, mental challenges, and the balance of work life and home life.¹² To combat the Navy's retention issues and ensure that quality SWOs are retained, decision-makers must consider both extrinsic and intrinsic motivators.

¹² As compiled from the 2000 Military Exit Survey, 2004 SWO Continuation Intentions Quick Poll, 2005 Junior Officer Survey, and the August 2005 Status of Forces Survey of Active-Duty Members.

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III. CURRENT POLICIES AND LEGISLATION AFFECTING SURFACE WARFARE OFFICERS' PAY, PERFORMANCE EVALUATION, AND PROMOTION

A. OVERVIEW

As a branch of the military bureaucracy, the Navy follows very specific governance for maintaining its officer corps. This chapter addresses the legislation and policies affecting the pay and advancement of Surface Warfare Officers. The first section reviews the structure of the current military pay system, based on policy and legislative mandates—including the four incentive pays used to address retention in the Surface Warfare Officer community. The second section discusses the legislative process for approving and changing military compensation. The third section examines the naval officer performance review system, focusing on the SWO community. This chapter also revisits SWO promotion timing, promotion opportunity, and promotion as a measure of performance.

B. MILITARY PAY SYSTEM

The US military pay system is described by the Defense Advisory Committee on Military Compensation as an “inefficient mix of cash, in-kind, and deferred compensation” (DACMC, 2006, p. 2). Surface Warfare Officer pay is derived from the military’s tiered basic pay table, in which rank and seniority are used to calculate the common base salary used by all services (DACMC, 2006). Due to the aforementioned lack of “skewness” in the military pay table, basic pay alone may be insufficient to attract and retain an effective military force (Asch & Warner, 2001, p. 524). Therefore, allowances, special and incentive pays (e.g., SWO retention bonuses), annual pay adjustments, and tax advantages are added to base salary to close the gap between civilian and military wages. Furthermore, in-kind benefits (such as health care) and

deferred benefits (such as a life-long protected annuity upon reaching the vesting point of 20 years of service) complete the military pay system, which DACMC has recently criticized (DACMC, 2006).

1. Cash Payments

United States Code, Title 37—Pay and Allowances of the Uniformed Services (2004b) details the administration of all active-duty military compensation to include basic pay, special and incentive pays, and allowances. *United States Code, Title 10—Armed Forces* (2004a) provides pay information for retired service members.

a. Basic Pay and Allowances

The FY 2008 monthly basic pay table, shown in Appendix A, depicts the “main component of an individual’s salary” (Under Secretary of Defense for Personnel and Readiness, 2008a, p. 1). For example, commissioned officers with six years of service, who have no prior enlisted service, and who are in the pay grade of Lieutenant (O-3), earn \$4,763.10 per month (Under Secretary of Defense for Personnel and Readiness, 2008a). Added to basic pay, the two most common allowances naval officers receive are Basic Allowance for Housing (BAH) and Basic Allowance for Subsistence (BAS), both of which are non-taxable allowances intended to offset the cost of housing and meals (Under Secretary of Defense for Personnel and Readiness, 2008b). BAH and BAS are “based in the historic origins of the military in which the military provided room and board (or rations) as part of a member’s pay” (Under Secretary of Defense for Personnel and Readiness, 2008b, BAS). Thus, all current service members receive either government-provided housing or a housing allowance and an allowance for subsistence. The current housing allowance depends on duty location, pay grade, and dependent status (i.e., if the service member has a spouse, children, etc.).

The intent of BAH is to provide uniformed service members with permanent duty within the 50 United States accurate and equitable housing compensation based on housing costs in local civilian housing markets, and is payable when government quarters are not provided. (Department of Defense Per Diem, Travel and Transportation Allowance Committee, 2007c, p. 1)

BAS is a fixed amount, regardless of duty station, which is recalculated annually based on the United States Department of Agriculture (USDA) food cost index. Currently, SWOs receive a monthly BAS payment of \$202.76. (Under Secretary of Defense for Personnel and Readiness, 2008b)

Additional allowances are paid to naval officers: Cost of Living Allowance (COLA), Overseas Housing Allowance (OHA), and Family Separation Allowance (FSA). These allowances depend on service location or, during shipboard assignments, length of time at sea. COLA is received only in designated geographic locations to compensate for excessive costs specific to non-housing expenditures in communities where costs are at least 8 percent higher than the compensation received for BAH (Department of Defense Per Diem, Travel and Transportation Allowance Committee, 2007a). According to the Department of Defense Per Diem, Travel and Transportation Allowance Committee (2007b), OHA is paid to members who are stationed overseas when government housing is either not provided or not available, compensating for the majority of added expenses incurred by living in non-government housing. OHA includes monthly rent, utilities allowances, and a one-time move-in expense allowance (Department of Defense Per Diem, Travel and Transportation Allowance Committee, 2007b). FSA compensates SWOs for service either aboard ship or in a duty location where they are separated from their dependants for over 30 consecutive days (Koopman & Hattiangadi, 2001). For most naval officers, basic pay and allowances “constitute the largest portion of cash compensation—well over 90 percent on average” (DACMC, 2006, p. xxv). However, special and incentive pays are becoming a larger portion of total compensation for the surface warfare community.

b. Special and Incentive Pays: Surface Warfare Officer Bonuses

Special and incentive (S&I) pays create flexibility in the military compensation system by providing each service the ability to respond to market supply and demand forces, to compensate for particular duty stations or assignments, and to create incentives to acquire or remain in specific skill sets (DACMC, 2006). S&I pays allow the services to “meet specific staffing challenges [...] for improving staffing and

personnel readiness” (DACMC, 2006, p. xxv). However, with over 60 different special and incentive pays, managing the program has become cumbersome and, in some instances, creates less overall flexibility. As stated by DACMC (2006), “the proliferation of pays makes the system difficult to monitor and manage [...] some of these pays have impeded flexibility, not increased it” (pp. xxv-xxvi). Particularly, the SWO community employs several S&I pays to target retention issues. According to DACMC (2006), the following S&I pays represent the special and incentive pays designed specifically for Surface Warfare Officers:

- Surface Warfare Officer Continuation Pay
- Junior SWO Critical Skills Retention Bonus
- SWO Critical Skills Bonus
- Senior SWO Critical Skills Retention Bonus
- Nuclear Accessions Bonus¹³
- (Nuclear) Career Accessions Bonus
- Nuclear Officer Continuation Pay
- (Nuclear) Annual Incentive Bonus
- Career Sea Pay
- Career Sea Pay Premium
- Imminent Danger/Hostile Fire Pay
- Hardship Duty Pay Location/Mission.

While the monetary value of S&I pays and bonuses vary, the purpose remains the same: to compensate service members for dangerous and arduous duty, recruit or retain proper manning levels, and improve personnel readiness in targeted communities (DACMC, 2006). In the SWO community, the first four incentive pays listed above are specifically designed to target retention at various ports of exit. Table 3 describes the intricacies of each bonus program: total payout, obligation, eligibility requirements, eligibility YCS, and the associated bonus payout plan.

¹³ Nuclear bonuses only apply to nuclear-qualified officers, which is only a small portion of the SWO community.

Table 3. Description of the Four SWO Retention Bonuses
(Adapted from Chief of Naval Operations, 2002; Chief of Naval Operations, 2004a; Chief of Naval Operations, 2005b; Commander Naval Surface Forces, 2008b; Navy Personnel Command, 2008a; Navy Personnel Command, 2008b)

Incentive Pay Program	Total Payout	Obligation	Eligibility	Eligibility YCS	Payout Plan
SWOCP	\$50,000	*Complete DH tour obligation (Approximately 10.5 YCS)	*Completed MSR from original commissioning program *SWO Qualified *Selected for DH tour *Application submitted prior to graduating DH School (~7.5 YCS) *Sea Duty Assignable	3 - 7.5 YCS	*First Payout upon acceptance of SWOCP agreement ~4 - 7.5 YCS = \$10,000 *First of four annual installments on the anniversary date of DH School or DH tour report date ~7.5 YCS = \$10,000 ~8.5 YCS = \$10,000 ~9.5 YCS = \$10,000 ~10.5 YCS = \$10,000
Junior SWO CSRB	\$25,000	*Concurrent with SWOCP commitment (Approximately 10.5 YCS)	*SWO qualified *Permanently appointed to O-3 *Completed DIVO tour obligation *Completed less than 25 years of active duty service before end of Junior SWO CSRB contract *Completed 5 YCS *Approved for SWOCP *Application submitted before 6 YCS *Sea Duty Assignable	3 - 6 YCS	*Payout on anniversary of DH tour report date ~6 YCS = \$15,000 ~7 YCS = \$5,000 ~8 YCS = \$5,000
SWO Critical Skills Bonus	\$46,000	*One-year or three-year contracts (through 15 YCS)	*SWO qualified *Permanently appointed to O-4 *Completed DH tour obligation *Completed less than 25 years of active duty service before end of SWO Critical Skills Bonus contract *Sea Duty Assignable *Not under SWOCP contract	Two Years as O-4 or senior (~ 12 YCS)	*Payouts eligible on the second anniversary of promotion to O-4 *Subsequent payouts on third and fourth anniversary of promotion to O-4 *One-year obligations: O-4 + two years = \$12,000 O-4 + three years = \$12,000 O-4 + four years = \$12,000 *Three-year obligation: O-4 + two years = \$22,000 O-4 + three years = \$12,000

					O-4 + four years = \$12,000
Senior SWO CSRB	*\$15,000 per year for O-5 billets *\$20,000 per year for O-6 billets	*Completion of qualified billet assignment *Minimum one year contract	*SWO qualified *Permanently appointed or frocked to O-5 or O-6 *Completed XO or XO Special Mission tour *Currently serving in qualifying billet *Not completed more than 24 years of active duty service	~ 16 - 24 YCS	*Lump sum divided into 12 monthly payments upon reporting to designated billets \$15,000 for O-5 billets \$20,000 for O-6 billets *Monthly payments for remainder of contract

(1) Surface Warfare Officer Continuation Pay (SWOCP). On October 1, 1999, SWOCP was authorized as a retention incentive to encourage junior SWOs to commit to completing a full department head (DH) tour obligation. This commitment corresponds to two DH tours or a “single longer tour identified as a two-tour equivalent by COMNAVPERSCOM (PERS-41)” (Chief of Naval Operations, 2005b, p. 2). Eligible officers must meet standard requirements: qualified SWO, selected for a DH tour, completed original service obligation, and completed the SWOCP application prior to graduation from DH school. Upon approval, they are authorized \$50,000 for completing the new service obligation. The SWOCP remains “available each year in numbers sufficient to meet the need for Surface Department Heads” (Chief of Naval Operations, 2005b, p. 2). As long as SWOs meet the minimum eligibility requirements and the shortage of necessary SWOs to fill DH billets exists, junior SWOs will be approved for the SWOCP retention bonus. Quantity, not quality, is targeted.

(2) Junior SWO Critical Skills Retention Bonus (CSRB). In addition to SWOCP, “the FY06 *Defense Appropriations Act* [authorized] the \$25,000 Junior SWO Critical Skills Retention Bonus (CSRB)” that provided further financial incentive to junior SWOs to remain in the surface warfare community and retain through

their full department head obligation (Navy Personnel Command, 2008a, p. 1). Beginning April 1, 2006, Junior SWOs have the opportunity to receive a total of \$75,000 to retain in the Navy and serve through their DH tour obligation (Navy Personnel Command, 2008a). Eligibility for the junior SWO CSRB is restricted to applicants beyond 6 YCS; however, exceptions were authorized for the first three months of the program's implementation for year groups (YG) 98, 99, 00, corresponding to accession years 1998, 1999, and 2000 (Navy Personnel Command, 2008a). This retention bonus targets junior SWOs even earlier in their career, as applications are required by an officer's sixth year of commissioned service. Eligibility requirements include: qualified SWO, appointed to Lieutenant (O-3), completed the DIVO tour obligation, and approved for the SWOCP contract. Whereas the SWOCP bonus targeted officers between 3 and 7.5 YCS, the Junior SWO CSRB targets SWOs between 3 to 6 YCS. Since the Junior SWO CSRB depends on approval of the SWOCP, this bonus is similarly contingent upon the shortage of SWO department heads.

(3) SWO Critical Skills Bonus. The Surface Warfare Officer Critical Skills Bonus became effective October 1, 2002, and targeted Lieutenant Commanders (O-4) midway through their careers as an incentive to retain in the SWO community through 15 YCS (Navy Personnel Command, 2008b). Eligible Lieutenant Commanders would receive up to \$46,000 provided they stay SWO through 15 YCS. Eligibility requirements include: qualified SWO, permanently appointed to O-4, and completed the DH obligation (Chief of Naval Operations, 2002). The SWO Critical Skills Bonus essentially covers mid-grade officers beginning at approximately 10.5 YCS as an incentive to remain in the Navy through their second shore tour and will include selection for further sea duty assignments. The SWO Critical Skills Bonus coincides with the expiration of the two previous bonuses: the Junior SWO CSRB and SWOCP. It also corresponds with another critical point of exit just beyond the half-way career milestone toward a 20-year military career. The contract also contains a smaller bonus amount of \$12,000 associated with a one-year service obligation in lieu of the three-year obligation. However, officers who apply in advance and are approved prior to their second anniversary of promotion to O-4 are eligible for the full \$46,000 bonus associated

with the three-year commitment. The objective of the SWO Critical Skills Bonus is to bridge the manning shortfalls depicted in Figure 8, specifically at the mid to senior O-4 level at 13, 14, and 15 YCS. (Chief of Naval Operations, 2002; Navy Personnel Command, 2008b)

(4) Senior SWO Critical Skills Retention Bonus (CSRB). The Senior SWO CSRB is the final SWO incentive pay targeting specific shortfalls in the senior SWO community. This bonus is designed to attract eligible SWOs to fill specific executive officer (XO), commanding officer (CO), and senior-level staff officer billets, beginning at approximately 16 YCS and continuing through 24 YCS. The Senior SWO CSRB provides \$15,000 per year for Commander (O-5) billets and \$20,000 per year for Captain (O-6) billets. Eligibility requirements include: qualified SWO, promoted to Commander or Captain, completed an XO or XO Special Mission tour, assigned to a qualified O-5 or O-6 billet, and the ability to complete the qualified assignment before 25 YCS. Qualified billets include such positions as Commanding Officer Afloat, Executive Officer Afloat, Chief Staff Officer, Commanding Officer Shore Activity, and Commanding Officer Operational Forces. The Senior SWO CSRB targets the critical manning shortfall at the senior SWO level and attempts to close the inventory gap of 271 Surface Warfare Officers at the O-5 rank when compared to the Officer Programmed Authorization, as depicted in Figure 8. (Chief of Naval Operations, 2004a; Commander Naval Surface Forces, 2008b)

c. Effect of SWO Incentive Pays on Retention

Are incentive pays working, or are they merely transforming the surface fleet? With the introduction of SWOCP in 1999, three more incentive pays were added to address SWO manning shortfalls in the mid-grade to senior officer ranks. Surface Warfare Officers now have the ability to collect nearly \$200,000 in incentive pays over the course of a 25-year career, depending on billet assignment and promotion timing. Despite the increasing incentive value, Figure 8 shows a current shortage of 552 SWOs between O-3 with 9 YCS and O-5 with 22 YCS. Perhaps the bonuses are not efficiently targeting the SWO community. Even with the surplus of junior officers (i.e., Lieutenants

with eight years of commissioned service and junior), retaining more senior officers remains an issue. Perhaps there is a more optimal method for allocating the incentive pay budget that not only increases the quality of Surface Warfare Officers but also meets current and future manning requirements. (Commander Naval Surface Forces, 2008b)

d. Annual Adjustments and Tax Advantages

The annual military pay raise is another tool used to adjust basic pay to meet manpower requirements. From January 1, 2000, through the end of 2006, legislation approved an annual pay raise of 0.5-percent above the private-sector average increase, as calculated by the Employment Cost Index (ECI) (Under Secretary of Defense for Personnel and Readiness, 2008b). *Public Law 110-181* (i.e., the *National Defense Authorization Act for Fiscal Year 2008*), signed on January 28, 2008, approved a 3.5-percent proposed pay increase for calendar year 2008 (US House of Representatives, 2008). Additionally, House Resolution 1585 contains verbiage supporting future pay increases of 0.5-percent above the ECI for fiscal years 2009 through 2012. The *FY 2008 National Defense Authorization Act: Selected Military Personnel Policy Issues* provides further explanation that defends the pay increase, citing the ongoing operations in the Middle East and other military pay concerns as factors (CRS, 2007).

Tax exemptions are another pay adjustment the federal government employs to level the difference between military and civilian compensation. While basic pay is taxed at the appropriate federal level, allowances such as BAH and BAS are not taxed. These allowances total nearly 1/3 of a service member's total cash payment and provide a sizeable annual savings (Under Secretary of Defense for Personnel and Readiness, 2008b). Duty assignments in combat zones also provide federal tax benefits in the form of a Combat Zone Tax Exclusion (CZTE). In 2008, spending just one day of the month in a designated combat zone provides federal tax relief for basic pay, bonuses, and special and incentive pays for the entire cash payments for enlisted personnel, and up to \$7,100.10 for officers (Under Secretary of Defense for Personnel and Readiness, 2008b). Additionally, some individual state laws provide tax exemptions for active-duty military service members. For example, officers who are legal residents of Illinois do not

pay state or local income taxes on their military “pay for duty” (Illinois Department of Revenue, 2007, p. 3). Furthermore, nine states (i.e., Alaska, Florida, Nevada, New Hampshire, South Dakota, Tennessee, Texas, Washington, and Wyoming) do not require state income tax on wages earned for legal residents (Federation of Tax Administrators, 2007).¹⁴ Upon attaining legal residency in one of these states, SWOs can retain their residency even after being reassigned to another location, thereby continuing to benefit from no state income tax on military wages (Navy Personnel Command, 2007).

2. In-kind Benefits (Health Care)

In the midst of rising health care costs, employer-sponsored health care has become a critical recruiting and retention tool in the US workplace. Total health care spending in 2005 reached \$2 trillion, and it is expected to double by 2015 (NCHC, 2007). As a result of rising annual premiums, nearly 47 million Americans are uninsured at the time of this writing. Many insurance recipients report changing their lifestyles to cover rising medical-related debt, housing problems resulting from medical debt, and reductions in food and heating expenditures to pay for medical debt (NCHC, 2007). Employer-sponsored programs that defray or significantly reduce these growing costs provide a significant quality of life improvement for employees receiving adequate insurance and medical services.

TRICARE, which serves as the DoD health care provider, “compares favorably with civilian health care plans on many measures, and military members consider it an important and valuable part of their compensation package” (DACMC, 2006, p. 72). TRICARE contains three insurance options: TRICARE Prime, TRICARE Extra, and TRICARE Standard. As outlined in Table 4, insurance costs to service members vary, depending on enrollment in a specific program, military status (i.e., active duty, reservist, or retired), and the status of the treatment facility administering the health care (i.e., military-sponsored or civilian).

¹⁴ Though no state income tax is paid on wages earned, New Hampshire and Tennessee residents pay state tax on dividends and interest (Federation of Tax Administrators, 2007).

Table 4. TRICARE Benefit Summary for Beneficiaries under Age 65
(DACMC, 2006, p. 74)

	TRICARE Prime	TRICARE Extra	TRICARE Standard
Eligible beneficiary groups	Active duty, ^a active duty dependents, <65 retirees/dependents	Active duty dependents, <65 retirees/dependents	Active duty dependents, <65 retirees/dependents, reservists/dependents
Enrollment required	Yes, default option for dependents of junior enlisted active duty Others must enroll	Dependents of junior enlisted must enroll; others are enrolled in Extra and Standard unless they chose to enroll in Prime	
Premium contribution	None for active duty or their dependents \$460/yr for retirees' family coverage	None	None for active duty dependents and retiree/dependents 28% of actuarial costs for reservists/dependents ^b
Cost sharing for military treatment facility care	Same for all plans: No cost other than a per day cost for hospital care		
Cost sharing for civilian care			
Annual family deductible	\$0	Combined deductible for Extra and Standard: \$300	
Cost sharing for outpatient care	Active duty and their dependents: \$0 Others: \$12/visit	Active duty dependents: 15% Others: 20%	Active duty dependents: 20% Others: 25%
Cost sharing for inpatient care	Active duty and their dependents: \$0 Others: \$11/day ^c	Active duty dependents: \$14/day ^c Others: 20% ^d	Active duty dependents: \$14/day ^c Others: 20% ^d
Out-of-pocket maximum (family)	Active duty: \$1,000 Others: \$3,000	Active duty: \$1,000 Others: \$3,000	Active duty: \$1,000 Others: \$3,000

- Active duty personnel are automatically enrolled in Prime, through which all their care is provided without charge.
- The monthly contribution for calendar year 2005 was \$73 for single coverage and \$233 for family coverage.
- Higher for mental health care.
- Cost sharing for hospital services, but not professional services, is capped at \$250 per day.

There is no annual premium for active-duty service members and their dependents for TRICARE Prime, TRICARE Extra, and TRICARE Standard. However, retirees pay \$460 per year for TRICARE Prime family care and reservists pay 28-percent of the medical costs for their personal and their dependents' medical care (DACMC, 2006). In comparison to civilian sector insurance options, active duty and retired military members save thousands of dollars in annual premiums alone, as "the average premium contribution for family coverage in employer-provided plans in the civilian sector was \$2,713 in 2005" (DACMC, 2006, p. 75). Additional savings occur by factoring in per-visit fees and prescription medication costs.

3. Deferred Benefits (Retirement)

The final critical component of the military pay system is the deferred payment provided by military retirement. A Surface Warfare Officer is vested after 20 years of service. According to DACMC (2006), the original system, established by Congress in 1947, was designed to serve two purposes:

- Provide income for military members in their old age
- Create a retirement incentive for those active-duty military members with 20 to 30 years of service who did not have future promotion opportunities.

In its current state, three retirement plan options remain: FINAL PAY, HIGH-3, and REDUX. The most senior personnel with active-duty service starting prior to September 8, 1980, are eligible for the FINAL PAY retirement plan. Under FINAL PAY, after 20 years of service, retired officers earn a lifetime inflation-protected annuity equal to 2.5-percent of the basic pay at the date of retirement, multiplied by each year served (up to 30 years of service). Beyond 30 years, the retirement annuity remains capped at 75-percent of the final basic pay. SWOs entering after September 8, 1980, have the option of selecting either the HIGH-3 or REDUX retirement plans. HIGH-3 is similar to FINAL PAY, except HIGH-3 uses the average of the three highest years of basic pay in retirement pay calculations rather than basic pay at the date of retirement. By electing REDUX, officers receive a \$30,000 Career Status Bonus at the 15-year mark

and earn retirement pay as calculated by the HIGH-3 methodology, reduced by 1-percent for each year under 30 years of service. (Defense Finance and Accounting Service, 2007)

Though a protected retirement annuity provides a significant retention incentive, data from the Defense Manpower Data Center provides evidence that less than 40 percent of all officers will complete 20 years of service (DACMC, 2006). Figure 21 indicates that the highest proportion of officers leave military service after completing their initial service obligation near the five-year mark. There is a steady decrease in the proportion of officers leaving from five years through 12 years of service, except for an increased spike occurring between eight to nine years. This is consistent with the end of service obligation for naval aviators. However, retention past the initial service obligation seems to be influenced by retirement benefits. Figure 21 shows a gradual decline in losses as “the pull of the retirement system tends to dominate retention beyond 10-12 years of service” for most naval officer communities (DACMC, 2006, p.18). However, this phenomenon may not be the case for the SWO community, since other retention bonuses also have an impact on retention. The nearly flat rate of loss associated with the period between 12 to 20 years of service and the abrupt spike occurring at 20 years of service suggests the strength of the 20-year vesting program.

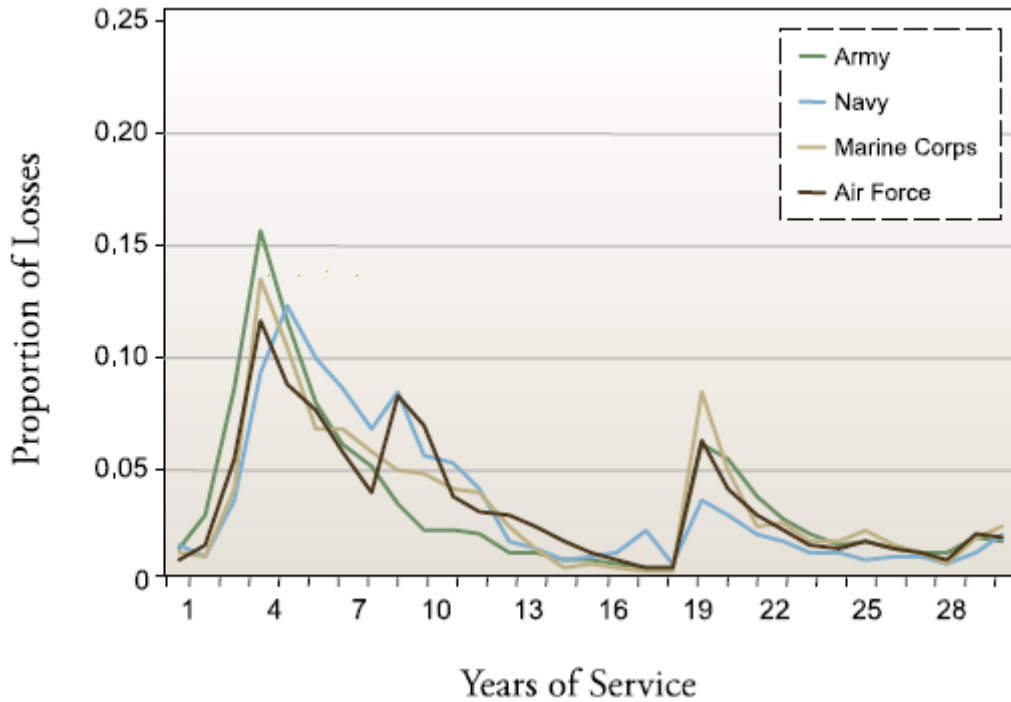


Figure 21. Officer Loss Distribution
(DACMC, 2006, p.19)

C. LEGISLATIVE PROCESS FOR MILITARY COMPENSATION

The legislative process for approving annual military compensation is complex. First, “the President is required by law, to submit the budget to Congress by the first Monday in February,” which includes proposed expenditures for military compensation (McCaffery & Jones, 2004, p. 30). However, this budget submittal is not necessarily signed into law for the next fiscal year. For several months, Congress debates the President’s budget, writing separate authorization and appropriation bills, which are returned to the President to be either signed into law or vetoed (McCaffery & Jones, 2004). For defense personnel and manpower spending, the Congressional budget process for the *National Defense Authorization Act* includes four main steps en route to the President’s desk for final approval:

1. Concurrent Budget Resolution
2. Reconciliation Bill (if needed)

3. Defense Authorization Bill

4. Defense Appropriation Bill.

During the Concurrent Budget Resolution process, the House of Representatives and Senate Budget Committees debate and adjust the President's budget. These committees set spending and tax (revenue) totals and also set spending levels by functional area, such as defense. As necessary, a Reconciliation Bill affecting taxes and mandatory spending may also be added to the budget resolution. The Concurrent Budget Resolution is then forwarded to the House and Senate Authorization and Appropriation Committees by April 15.¹⁵ While the Defense Authorization Bill, which creates authorization to spend specific levels of money on defense-related activities (including military compensation) is supposed to be completed and signed before the Defense Appropriation Bill, which makes money available for defense spending, this does not always occur.¹⁶ In the event that the Appropriations Bill is not signed by the start of the new fiscal year (October 1), a Continuing Resolution Appropriation (CRA) allows spending at previous levels to maintain the status quo while preventing spending on new programs. Additionally, Supplemental Appropriations are issued to handle national or international emergencies and military requirements not normally included in the Defense Appropriation Bill. (McCaffery & Jones, 2004)

After the Appropriations Bill is signed into law, approving and providing funds for federal spending, "the Department of Defense, the Office of the Secretary of Defense and the DOD Comptroller receive and allocate the budget for national defense appropriated by Congress" (McCaffery & Jones, 2004, p. 37). Military pay for active duty and retired personnel are then paid in compliance with *United States Code, Title 37* and *Title 10* respectively (United States Code, 2004b; United States Code, 2004a). This process for approving military pay expenditures follows *Article 1, Section 9* of the *United States Constitution* in that "no Money shall be drawn from the Treasury, but in

¹⁵ The President does not approve the Concurrent Budget Resolution, as it is an internal document (though public record) directing the action of Congress (McCaffery & Jones, 2004).

¹⁶ The actual order of submission of the Defense Authorization Bill and the Defense Appropriation Bill depends on many factors, such as time spent in each respective Subcommittee or time debated on the floor of the House of Representatives (McCaffery & Jones, 2004).

Consequence of Appropriations made by Law; and a regular Statement and Account of the Receipts and Expenditures of all public Money shall be published from time to time.”

Unlike civilian compensation policy, changing the military compensation system or the pay table “requires legislative action,” as the change must be approved by Congress and subsequently signed into public law by the President of the United States (CBO, 1995, p. 47). Attempts to bypass the normal avenues for change are limited by legislation and the separation of powers among the branches of government. Regarding alternative measures for approving compensation changes, the Congressional Budget Office (1995) states:

The President has only limited authority, under title 37, section 1009 of the US Code, to reallocate a portion of the annual pay raise among grade and year-of-service categories; no category may receive less than 75 percent of the raise it would get under an across-the-board raise [...] Congress would either have to grant specific authority for the Department of Defense to change the pay table or [...] establish a specific new table through legislation. (p. 47)

D. SURFACE WARFARE OFFICER PERFORMANCE EVALUATION SYSTEM

Like most organizations, the US Navy employs a formal assessment system to evaluate the performance of its workers. In accordance with *Bureau of Naval Personnel Instruction (BUPERSINST) 1610.10A*, senior officers (reporting seniors) are responsible for assessing their subordinates’ performance (Bureau of Naval Personnel, 2005). A Surface Warfare Officer’s performance is evaluated annually using a fitness report (FITREP), which according to Cozzetto (1990) is used as the “primary yardstick for evaluation and eventual judgment” for promotion (p. 235). Appendix B contains a blank copy of an officer FITREP, form NAVPERS 1610/2.

1. Contents of a FITREP

The performance-based components of an officer’s FITREP are the performance trait grades, comments on performance, and promotion recommendation (Schwind &

Laurence, 2006). According to the Bureau of Naval Personnel (2005), reporting seniors evaluate subordinate officers across seven performance traits, which include:

1. Professional expertise
2. Command or organizational climate and equal opportunity
3. Military bearing and character
4. Teamwork
5. Mission accomplishment and initiative
6. Leadership
7. Tactical performance (including SWO qualifications).

For each performance trait, SWOs are graded on a numerical scale of 1.0 through 5.0, in which 1.0 represents “disappointing performance” as the lowest score, and 5.0 signifies “superstar performance” as the highest score (Bureau of Naval Personnel, 2005, pp. 5-6). The average of the seven performance trait scores is calculated and recorded as the member trait average (Bureau of Naval Personnel, 2005). The summary group average is calculated as the mean of all member trait averages in the group of SWOs (at the same rank) being evaluated during that specific promotion cycle (Bureau of Naval Personnel, 2005). By displaying both the member trait average and the summary group average, FITREP readers can assess relative performance.

FITREPs also include a comments section, in which the reporting senior can articulate the officer’s performance. Though the comments generally correspond to performance trait scores, specific comments are only required for “all 1.0 grades, three 2.0 grades, and any grade below 3.0 in Command or Organizational Climate/Equal Opportunity” trait category (Bureau of Naval Personnel, 2005, p. 6). Finally, a promotion recommendation is endorsed by the reporting senior. According to the Bureau of Naval Personnel (2005), this recommendation is categorical and includes (in descending order): early promote, must promote, promotable, progressing, significant problems, and NOB (for non-observed reports). The number of “early promote” and “must promote” recommendations are limited based on the summary group size, as depicted in Table 5.

Table 5. Maximum Limits on “Early Promote” and “Must Promote” Recommendations
(Adapted from Bureau of Naval Personnel, 2005, p. 1-19)

Summary Group Size	Early Promote	Must Promote (May be increased by one for each Early Promote recommendation not used)			Promotable
	LDO O-1/O-2 O-3 thru O-6	LDO O-1/O-2 O-3	O-4	O-5/O-6	O-1/O-2 (except LDO)
1	1	No Limit			No Limit
2	1		1	1	
3	1		1	1	
4	1		1	1	
5	1		2	1	
6	2		1	1	
7	2		2	1	
8	2		2	2	
9	2		3	2	
10	2		3	2	
11	3		3	2	
12	3		3	2	
13	3		4	3	
14	3		4	3	
15	3		5	3	

For example, in a summary group of ten Lieutenant Commander (O-4) SWOs, a maximum of two officers could be recommended to “early promote”; three officers could be recommended to “must promote.” There is no restriction on the number recommended as “promotable” or lower (Bureau of Naval Personnel, 2005). The maximum limits for each promotion recommendation category allow for greater variation or spread in the promotion recommendations.

2. Grade Inflation

Though the limits on promotion recommendation categories partially control for rater bias, critics of the Navy’s FITREP system contend that individual trait averages exhibit “grade inflation” or leniency error (Bjerke, Cleveland, Morrison & Wilson, 1987, p. 1). According to Mathis and Jackson (2006), leniency error occurs when overall officer ratings fall at the high end of the 5.0-rating scale. After analyzing FITREPs for 582 naval officers, a study conducted by Thomas, Edwards, Perry, and David (1998)

found empirical evidence that trait scores in fitness reports displayed patterns of “extreme inflation” (p. 140). Thomas et al. (1998) concluded:

Because the military is a closed system that promotes from within, inflation of performance marks and rankings is probably inevitable. For this reason, selection boards are left to search for nuances in the narrative portion of the fitness report and to evaluate other career data. The quantitative information does little to distinguish between truly outstanding and merely good Navy officers. (p. 140)

There are no documented restrictions on the quantity of a particular score awarded for each performance trait category across all FITREPs submitted by a reporting senior. For instance, the reporting senior can grade all SWOs as 5.0 performers in each performance trait category, providing the necessary justification of the high marks in the comments sections of the FITREPs. To combat this grade inflation, each senior officer maintains a reporting senior’s cumulative average, which considers the average of all FITREPs at a given rank (i.e., average of all O-4’s evaluated over time). Promotion boards can view the reporting senior’s cumulative average along with the member’s trait average and the summary group average (PERS-80, n.d). In relation to other officers who the reporting senior evaluated over time, promotion board members can assess whether or not the officer’s performance was above average (i.e., higher than the reporting senior’s cumulative average). This provides a moderate measure of performance, though the significance of the distribution of scores around the reporting senior’s cumulative average is unclear. The board has a biased or somewhat limited evaluation of the officer’s true performance since the standard deviation is not reported, nor is a t-test conducted to assess the statistical significance between the member’s trait average and the reporting senior’s cumulative average.

E. SURFACE WARFARE OFFICER PROMOTIONS

Promotions through Lieutenant (O-3) are solely based on meeting minimum requirements and qualifications, while promotion to Lieutenant Commander (O-4) and more senior pay grades relies on the judgment of formalized promotion boards (Asch & Warner, 2001; Secretary of the Navy, 2002). These promotion boards are governed by

Secretary of the Navy Instruction (SECNAVINST) 1420.1B and tailored board precepts for each promotion board (Secretary of the Navy, 2006).

1. Promotion Zones and Promotion Timing

A Surface Warfare Officer's eligibility for promotion is determined by the Secretary of the Navy's annual promotion plan, which establishes promotion zones (Secretary of the Navy, 2006). Promotion zones, which are "the size of the population considered to fill projected [manpower] requirements," are established for each grade and competitive category (Yardley, Schirmer, Thie, & Merck, 2005, p. 11). Promotion zones classify which officers are eligible for consideration for promotion to a specific grade, based on lineal seniority (Secretary of the Navy, 2006). According to the Secretary of the Navy (2006), officers are categorized as "in zone" if they fall within the promotion zone, "below zone" if they are more junior than the officers "in zone" yet are still eligible for promotion, and "above zone" if they are more senior than "in zone" officers (pp. 8-9). Officers who are "below zone" and "above zone" may be considered for promotion as prescribed by the Secretary of the Navy (Secretary of the Navy, 2006). However, Navy policy restricts the "below zone" selection rate from exceeding 10-percent (Yardley et al., 2005).

Though promotion zones specify which officers are eligible for promotion in a given fiscal year, a more generalized promotion timing plan was published in *Department of Defense Instruction 1320.13* (Yardley et al., 2005). The promotion timing and promotion opportunities for promotion to Lieutenant Junior Grade (O-2) through Captain (O-6) are contained in Table 6.

Table 6. Promotion Timing and Promotion Opportunities
(Adapted from Yardley et al., 2005, pp. 12-13)

To Grade	Promotion Timing	Promotion Opportunity
O-2: Lieutenant Junior Grade	2 yrs	All Qualified
O-3: Lieutenant	4 yrs	All Qualified
O-4: Lieutenant Commander	10 yrs \pm 1 yr	80% \pm 10%
O-5: Commander	16 yrs \pm 1 yr	70% \pm 10%
O-6: Captain	22 yrs \pm 1 yr	50% \pm 10%

Promotion timing, also called the promotion flow point, is the average years of commissioned service before eligibility for promotion to the next rank (Yardley et al., 2005). For instance, Lieutenant (O-3) SWOs will be “in zone” for promotion to Lieutenant Commander (O-4) at approximately 10 years, plus or minus one year, of commissioned service. As stated by Yardley et al. (2005), the promotion opportunity is “the percentage of all officers selected for promotion, and includes officers selected from above, in, and below the zone” (p. 13). For example, the O-4 promotion board selects approximately 80-percent of the qualified officers, with a variance of plus or minus 10-percent depending on the officer community. Though promotion timing and promotion opportunity is standard across all branches of service, the Secretary of the Navy has authority to temporarily circumvent the policy if required to meet manpower requirements or maintain authorized grade strength (Secretary of the Navy, 2006).

Due to the SWO inventory gap at mid-grade and senior levels, the SWO community has historically selected above-the-mean promotion opportunity rates (and closer to the upper-range limits) established by the Department of Defense (DoD). Table 7 depicts the SWO promotion rates (for both conventional and nuclear-qualified SWOs) to Lieutenant Commander (O-4) for FY03 through FY08. Table 8 displays similar SWO promotion rates to Commander (O-5), and Table 9 shows comparable SWO promotion rates to Captain (O-6). In Table 7, Table 8, and Table 9, for each promotion category (i.e., “above zone,” “in zone,” and “below zone”), the data are displayed as the number of

SWOs eligible for promotion, the number of SWOs selected for promotion, and the overall percentage of SWOs selected for promotion.

Table 7. SWO Promotion Rates to Lieutenant Commander (O-4) for FY03 through FY08
(Adapted from Commander Navy Personnel Command, 2008a)

Lieutenant Commander (O-4): 111X/116X									
Fiscal Year	Above Zone			In Zone			Below Zone		
	Elg	Sel	%	Elg	Sel	%	Elg	Sel	%
FY03	16	0	0.00%	217	203	93.55 %	615	7	1.14 %
FY04	21	0	0.00%	241	202	83.82 %	525	17	3.24 %
FY05	40	3	7.50%	249	221	88.76 %	501	4	0.80 %
FY06	33	1	3.03%	239	208	87.03 %	686	5	0.73 %
FY07	31	10	32.26%	260	229	88.08 %	564	13	2.30 %
FY08	22	3	13.64%	277	234	84.48 %	530	0	0.00 %

Table 8. SWO Promotion Rates to Commander (O-5) for FY03 through FY08
(Adapted from Commander Navy Personnel Command, 2008a)

Commander (O-5): 111X									
Fiscal Year	Above Zone			In Zone			Below Zone		
	Elg	Sel	%	Elg	Sel	%	Elg	Sel	%
FY03	182	15	8.24%	175	123	70.29%	312	1	0.32 %
FY04	169	3	1.78%	153	113	73.86 %	294	3	1.02 %
FY05	160	10	6.25%	128	98	76.56 %	349	0	0.00 %
FY06	150	5	3.33%	118	82	69.49 %	313	6	1.92 %
FY07	135	2	1.48%	146	108	73.97 %	311	0	0.00 %
FY08	140	9	6.43%	154	114	74.03 %	381	0	0.00 %

Table 9. SWO Promotion Rates to Captain (O-6) for FY03 through FY08
(Adapted from Commander Navy Personnel Command, 2008a)

Captain (O-6): 111X									
Fiscal Year	Above Zone			In Zone			Below Zone		
	Elg	Sel	%	Elg	Sel	%	Elg	Sel	%
FY03	147	0	0.0%	102	55	53.92 %	267	8	3.00 %
FY04	157	3	1.91%	112	52	46.43 %	280	6	2.14 %
FY05	149	2	1.34%	122	64	52.46 %	271	2	0.74 %
FY06	165	0	0.00%	92	42	45.65 %	243	2	0.82 %
FY07	164	3	1.83%	112	64	57.14 %	249	0	0.00 %
FY08	141	0	0.00%	134	80	59.70 %	253	0	0.00 %

As illustrated in Table 7, the past six Lieutenant Commander (O-4) board selection rates for SWOs were above the DoD-standard of 80-percent promotion opportunity (found in Table 6). Similarly, as depicted in Table 8, five of the past six fiscal year Commander (O-5) SWO board selection rates were above the DoD-standard 70-percent O-5 promotion opportunity. The exception was FY06, with a 69.49-percent “in zone” promotion rate. As shown in Table 9, the results were mixed for the Captain (O-6) promotion board statistics as some fiscal year boards selected above the DoD-standard 50-percent O-6 promotion opportunity, while other years’ boards fell below the standard promotion rate. The predominantly higher promotion rates suggest that the SWO community is attempting to combat lower retention at critical ports of exit (Commander Navy Personnel Command, 2008a).

2. Promotion as a Measure of Performance

According to Fairburn and Malcomson (2001), promotions serve two roles: to ensure a good person-job fit based on ability and to provide incentives for performance. Since promotion to a higher rank assumes increased responsibility and qualification for higher-level job assignments, the SWO promotion system strives to ensure a good person-job fit, where job is synonymous with pay grade and rank. In theory, officers who do not meet the standards of the next higher rank nor possess the prerequisite ability will not be selected for promotion (Asch & Warner, 2001). However, since promotion

opportunities at mid-grade promotion boards (particularly the O-4 board) are significantly lenient with a promotion opportunity up to 90 percent, it is quite possible that some officers may be selected to the next higher rank based on the relative quality of the eligible officer pool and not on whether that officer is ready to accept the responsibility of higher rank (Yardley et al., 2005). This situation is more probable for the surface warfare community, due to the SWO inventory gap at mid-grade and senior ranks. For example, suppose an annual O-4 board considered 100 SWOs for promotion, of which only 75 possess the ability and experience to successfully perform the duties of Lieutenant Commanders (O-4). Due to manning shortages in the SWO community at the O-4 level, the board precept suggested selecting 90-percent of eligible officers (the maximum promotion opportunity for O-4 boards from Table 6). Most likely, the promotion board would follow the precept guidance and select 90 SWOs for promotion, even though the readiness of 15 officers to assume the increased responsibility associated with the promotion is questionable.

Generally, this problem exists for any tournament-type promotion scheme, where the number of promotion slots is determined in advance, and there are no minimum performance standards. This dilemma is amplified in the SWO community as more high-quality SWOs leave the Navy at earlier ports of exit. In order to meet manning goals, lower-quality officers may receive promotions. The probability of this phenomenon occurring in the Navy decreases as the promotion board evaluates more senior-ranking officers, since the promotion opportunity significantly decreases as the rank becomes more senior (i.e., the average promotion opportunity to O-5 is 70 percent, in contrast to 80-percent promotion opportunity during O-4 boards) (Yardley et al., 2005).

From an incentive perspective, SWOs are not directly rewarded monetarily for their annual performance as recorded on their FITREPs. However, their performance is ultimately evaluated and rewarded during promotion boards. Promotion to a higher rank results in higher pay as the officer moves up the basic pay table and receives increased allowances. Though promotion boards consider FITREPs in their deliberations, other contents of Surface Warfare Officers' service records are judged as well. Advanced education, training, professional surface warfare qualifications, the challenge and

“visibility” of past job assignments, Joint Professional Military Education (JPME), joint experience, and personal awards are all assessed during promotion decisions (Schwind & Laurence, 2006; Secretary of the Navy, 2007a; Secretary of the Navy, 2007b). Promotion boards consider both past performance and potential ability to perform future assignments at a higher pay grade. Therefore, promotions may be a good proxy for performance among naval officers.

3. Potential Bias in Promotion Boards

Just as bias may be found in the Navy’s FITREP system, the SWO promotion board process may succumb to a similar fate. According to the Active Officer Promotions Branch (PERS-80), promotion boards rely on the assessment of officers’ service records by two board members, who individually grade their assigned records (PERS-80, n.d.). One of these board members is responsible for briefing each of the assigned officers’ records to the promotion board. After viewing the initial assessment grades, board members vote on each record. Following sometimes-lengthy deliberations, enough SWOs are selected for promotion without violating the selection rate defined in the board precept. Thus, within the promotion board process, there is ample opportunity for individual board members, including the briefer, to introduce bias during promotion boards.

Adverse personal knowledge of the officer is prohibited from being discussed by the briefer and other board members, unless this information is included in the member’s service record (PERS-80, n.d.). However, if the briefer or any other board member has personal knowledge of positive aspects relating to the officer’s performance or ability, the board may consider such input in its deliberations. Regarding personal knowledge affecting selection decisions, one anonymous Navy Admiral stated, “Knowledge—that’s human nature. To discredit that means you’re stupid. ‘Hey, I know him. He’s proven. This guy I don’t know, he looks good, but if I have to make a choice, I’m picking my guy’” (Schwind & Laurence, 2006, p. S90).

Additionally, much of the promotion decision relies on the quality of the brief presented to the board. For example, if the briefer breezes through the positive

characteristics of a SWO's service record but chooses to highlight the negative aspects, the board may be swayed to score the officer lower than if the brief had been presented in the opposite manner. The briefer could also influence the board's decision by non-verbal cues or expressions, such as frowning when discussing a particular FITREP or smiling when presenting a fellow alumnus. The bottom line is that all members of a promotion board play vital roles. Without proper training or supervision by a competent Board President, promotion board members may inadvertently bias the promotion board process.

F. CHAPTER SUMMARY

The governance maintaining the Navy's officer corps is steeped in both tradition and bureaucracy. Although the military pay system is skewed such that there is a much smaller pay differential between lower-level and upper-level management compared to the civilian sector, approximately 40 percent of the officers retain on active duty to reach the 20-year retirement annuity vesting point (DACMC, 2006). A Surface Warfare Officer's total compensation package contains more elements than just basic pay, as there is a large quantity of additional pays and benefits (both in-kind and deferred) that accumulate over a naval career. However, since basic pay is a significant amount of the total compensation package, its proper management is essential (CBO, 1995; DACMC, 2006; Under Secretary of Defense for Personnel and Readiness, 2008b). Additionally, changes to the basic pay table must be thoroughly supported with empirical evidence and Congressional support in order to pass through the legislative process in a timely fashion. Furthermore, the only performance element of the basic pay table is the pay grade axis, which is dependent on the naval officer promotion process.

The military's reliance on promotion as the sole source of monetary rewards for good performance causes certain problems for anyone seeking to increase performance incentives [...] As with any performance rewards, military promotions only provide incentives if the links between performance and promotions are clear. In the officer ranks, in particular, that may not always be the case. (CBO, 1995, p. 2-3)

Based on the legislative complexity of changing the basic pay table, a more accessible vehicle for implementing a performance-based compensation tool for the SWO community is to revise and optimize one or more of the SWO retention bonuses, specifically: the Surface Warfare Officer Continuation Pay (SWOCP), Junior SWO Critical Skills Retention Bonus (CSRB), SWO Critical Skills Bonus, or the Senior SWO CSRB programs.

While the fitness report (FITREP) evaluation system and the promotion board process have inherent flaws and biases, the promotion system is probably a more appropriate indication of overall performance. Promotions are good proxies to define high-quality characteristics to be used for developing a SWO retention bonus program that is tied to performance. In theory, promotion boards ensure that SWOs are paid their true value to the Navy, promoting the right officers and only the right officers, based on the quality of performance, as documented in their service records. Holding all else constant, the promotion board process ensures that SWOs are paid for their performance. Nevertheless, more efficient and optimal incentive pay (or bonus) programs may be necessary to provide incentives for higher performance and to combat current retention issues plaguing the surface warfare community.

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IV. PERFORMANCE AND COMPENSATION THEORY

A. OVERVIEW

To develop a stronger monetary incentive program, policymakers and decision-makers must first understand the theories behind performance and compensation. This chapter discusses performance and compensation theory. The first section addresses Labor Economic Theory affecting employees' performance, promotion, and compensation. The second section reviews the organizational behavior constructs behind pay for performance systems.

B. LABOR ECONOMIC THEORY

Attracting and retaining a talented workforce is essential for organizations to achieve a competitive advantage (Sturman, Trevor, Boudreau, & Gerhart, 2003). To maintain this advantage, the Navy must strive to decrease dysfunctional turnover, while taking advantage of functional turnover. Dysfunctional turnover occurs when the Navy fails to retain exceptional performers, especially in the surface warfare community (Sturman et al., 2003). Applying the theoretical discussion of Trevor, Gerhart, and Boudreau (1997), dysfunctional turnover can be quite harmful to the Navy, since the service loses valuable human capital. On the other hand, functional turnover is when poor performing employees leave the organization through quitting or being fired (Sturman et al., 2003). If managed properly, functional turnover can be a strategic option for organizations, since eliminating poorly performing employees makes room for new employees with higher potential for success (Trevor et al., 1997).

According to Sturman et al. (2003), an organization's compensation system influences the probability of voluntary quits affecting both types of turnover. Generally, employees who feel they are equitably compensated as a function of their performance and productivity are more willing to stay with their employers. Conversely, employees who are not satisfied with wages relative to their performance and ability are more likely to quit. However, in organizations in which work is team-based and team performance is

the ultimate goal, the relationship between individual performance and pay are not clearly defined (Sikula, 2001). Surface Warfare Officers are faced with the same dilemma, and retention decisions rely on several economic factors: perceived value to outside employers based on accumulated human capital, the efficiency of military wages, the desire to continue participating in the military promotion tournament system, the relationship between performance and turnover, and the correlation between performance and pay. These labor economic theories are further discussed in the following subsections.

1. Human Capital Theory

At ports of exit, SWOs are faced with the decision to stay with the Navy or to seek outside employment. The value these officers present to outside employers at the ports of exit (i.e., the salary that civilian employers are willing to pay) is directly proportional to the level of general human capital the officer possesses. However, the Navy values both general human capital and firm-specific (or military-specific) human capital that has accumulated during the SWO's career. According to Gibbons and Waldman (1999b), "general human capital refers to training that is valued equally by many firms, while specific human capital refers to training that has value at the firm providing the training but no value elsewhere" (p. 2,378). For example, graduate education for SWOs provides general human capital—the decision-making skills and advanced knowledge being equally valuable for both the military and civilian employers. On the other hand, Joint Professional Military Education (JPME) is firm-specific training that is only valuable to the military.

Human capital theory predicts that the Navy should keep wages high enough to sufficiently pay for both general and firm-specific human capital, thereby attempting to retain high-quality SWOs (Rosen, 1992). However, based on the limitations of the military's pay system and the complexity of accurately measuring human capital (since it is an intangible asset), compensating increased human capital is not always possible (Whitaker & Wilson, 2007). For instance, SWOs do not receive additional direct

compensation for completing a graduate degree. Theoretically, this should increase their general human capital and result in increased wages.

The level of overall human capital varies among Surface Warfare Officers, depending on training, operational experience, qualifications, education, and tenure in the Navy. Specifically, the Navy places a high value on individual surface warfare qualifications. Warfare qualifications signify the culmination of intense naval training and experience, thereby signaling acquired firm-specific human capital. Due to the shortage of mid-grade and senior-ranking SWOs, retention bonuses were implemented to compensate for military-specific human capital. Therefore, the Navy invests in both general and firm-specific human capital in the SWO community to attract and retain talent, though the level of investment may not capture the highest performers.

Most civilian firms value and invest in human capital (Whitaker & Wilson, 2007). The choice to invest in human capital involves a critical cost-benefit analysis (Ehrenberg & Smith, 2006). Costs are incurred in the near-term and include direct expenses, forgone earnings, and psychic losses; while benefits “accrue in the future” and commonly must be discounted for comparison with costs (Ehrenberg & Smith, 2006, p. 277).¹⁷ The return to training for general human capital is gained solely by the worker, since the employee is equally valuable to all firms due to the general nature of the training (Becker, 1993; Gibbons & Waldman, 1999b). According to Becker (1993) and Gibbons and Waldman (1999b), the employee commonly bears the entire cost of the general training, since it is a poor investment for the firm. However, both the worker and the firm share the cost and reap the benefits of firm-specific human capital (Becker, 1993; Gibbons & Waldman, 1999b). Other companies do not value firm-specific training, so the firm is not handcuffed to provide higher post-training wages that cover the increased productivity due to such training (Becker, 1993; Gibbons & Waldman, 1999b). However, workers will be motivated to quit if the firm captures all of the benefits of the firm-specific training (i.e., not increasing wages of employees who receive training and become more

¹⁷ Direct expenses, also called out-of-pocket expenses, include expenditures for tuition, fees, and learning materials. Forgone earnings refer to the compensation that is lost while workers are away from work. Finally, psychic losses are the psychological stress associated with learning difficult concepts, skills, or tasks. (Ehrenberg & Smith, 2006)

productive), so most firms will “pay a post-training wage that includes at least part of the increased productivity from training” (Gibbons & Waldman, 1999b, p. 2,378). In summary, based on the cost-benefit analysis of human capital, most firms only invest in firm-specific training.

Though firm-specific human capital is a good investment for most firms, empirical evidence supports variance in the level of investment among different organizations. Baker, Gibbs, and Holstrom (1994a) analyzed personnel data from a medium-sized US firm in the service industry from 1969 through 1988, which included 68,437 employee-years of data. The researchers found that the firm did not place much weight on firm-specific human capital, since both external hires and internal workers had similar value to the company and similar career performance (Baker et al., 1994a). The firm used a stable hierarchy, in which all jobs could be condensed into eight levels—with the first level being the primary “port of entry” and the eighth level being the Chief Executive Officer (Baker et al., 1994a, p. 898). Utilizing transition matrices and Chi-square statistical tests, Baker et al. (1994a) examined the mobility of workers within the firm and the entrance of external hires.

In general, external hires had slightly more general human capital, as evidenced by more education and longer experience in the job market (Baker et al., 1994a). Because of their higher level of general human capital, new hires were initially promoted more rapidly than incumbent internal workers (Baker et al., 1994a). According to Spence (1973), this promotion trend may be due to the signaling effect of higher education rather than actual general human capital accumulation. Since most firms have asymmetric information about workers’ actual productivity and performance, education level acts as a signal of ability and potential productivity (Spence, 1973; Ehrenberg & Smith, 2006). Higher education is generally associated with higher ability and potential for higher productivity, while lower education acts as a negative signal for both ability and productivity.

Additionally, the placement of more highly educated external hires into lower-level jobs may indicate that the firm is using the first few months as a trial period based on the asymmetric information about the workers’ productivity (Gibbons & Waldman,

1999a). Since the firm does not know the true level of human capital or productivity potential, it may not be willing to place external workers into higher-level jobs commensurate with their education and experience until they have proven themselves. Once the firm has gathered direct information about the productivity of the worker through tenure with the firm, education “play[s] a smaller role in determining earnings” and promotions (Ehrenberg & Smith, 2006, p. 307). Nonetheless, Baker et al. (1994a) found that subsequent career performance, measured as the highest hierarchical level attained, is fairly similar between external hires and internal workers. As reasoned by Baker et al. (1994a), this conclusion suggests that employees’ general human capital and job performance at lower hierarchical levels determined the probability of promotion through the ranks.

Also, Baker et al. (1994a) found that workers accumulate human capital at different rates, which in turn yields promotion at different rates. This conclusion suggests that some workers are on the “fast track [...since] those promoted quickly at one level are promoted more often and more quickly at the next level” (p. 916). Employees entered the fast track when assigned positions which maximized their productivity, thereby leading to faster promotions (Baker et al., 1994a, p. 901). However, this evidence contradicts the theoretical discussion of Gibbons and Waldman (1999b), who claimed that “an individual’s capital stock depreciates at a constant rate [...and] the human-capital production function exhibits diminishing marginal returns” (p. 2,378). According to Gibbons and Waldman (1999b), even fast-track workers experience some depreciation of human capital over time, so tolerating or continuing accelerated promotions of those on the fast track may not be the most efficient or best practice for firms to follow.

Finally, Baker et al. (1994a) examined the effects of human capital and hierarchical levels on employee salary. Using education level and tenure with the firm as measures of human capital, the authors conducted pooled regressions to estimate the returns to human capital, hierarchical levels, and a combination of the independent variables (Baker et al., 1994a). Additionally, a regression was run for the 1985 cross-section of the dataset for comparison purposes. The dependent variable was the

logarithm of the employee's real salary in 1988 constant dollars (Baker et al., 1994a). The regression results are depicted in Table 10.

Table 10. Effects of Human Capital and Hierarchical Level on Current Salary (Baker et al., 1994a, p. 907)

Independent variables	1970–1988 Pooled regressions			1985 cross section
	i. Human capital	ii. Levels	iii. Combined	
Year dummies	yes	yes	yes	no
Sex dummy	yes	no	yes	yes
Race dummy	yes	no	yes	yes
Intercept	10.53 (.02)	10.58 (.01)	10.59 (.01)	10.53 (.01)
13–16 years education	.04 (.004)	.	–.01 (.002)	–.01* (.008)
17–18 years education	.24 (.004)	.	.08 (.008)	.09 (.01)
19+ years education	.34 (.008)	.	.11 (.006)	.10 (.02)
Tenure	.05 (.001)	.	–.003 (.0009)	–.01 (.003)
Tenure ²	–.001 (.00008)	.	.0004 (.00006)	.0008 (.0002)
Level 2	.	.16 (.002)	.14 (.002)	.16 (.01)
Level 3	.	.36 (.003)	.33 (.003)	.33 (.01)
Level 4	.	.74 (.003)	.68 (.003)	.74 (.01)
Level 5	.	1.16 (.01)	1.08 (.01)	1.13 (.03)
Levels 6–8	.	1.43 (.02)	1.35 (.02)	1.49 (.05)
R ²	.35	.68	.71	.70
R ² , regression w/out year dummies	.30	.64	.67	N/A
N	43,629	43,629	43,629	3955
Dependent mean	10.75	10.75	10.75	10.76

In all regressions the dependent variable is the log of real salary in 1988 constant dollars. Education variables are dummies for those levels of schooling: BA = 16, etc. Tenure is years with company since hire. Regressions similar to i–iii using fixed effects rather than sex, race, and education dummies do not change the results significantly. Standard errors are in parentheses. Due to large sample sizes, most coefficients are significant at the 1 percent level. The one that is not is indicated by an asterisk.

Evaluated separately, both measures of human capital in this study (tenure and education) and hierarchical levels had statistically significant positive effects on employees' salary. However, in the combined regression, the results were mixed, as “tenure” and “13-16 years [of] education” variables had negative marginal effects on salary (Baker et al., 1994a, p. 907). As discussed by the authors, there is likely high

multi-collinearity in the combined regression model, since tenure and hierarchical levels are probably correlated (Baker et al., 1994a). The negative tenure effect can be explained by those on the fast track. Between two employees in the same hierarchical level, the worker with shorter tenure is on the fast track and potentially possesses higher ability. Based on the results from Baker et al. (1994a), the sample firm valued human capital and rewarded employees based on education and tenure, though tenure was recompensed at a diminishing rate because the marginal effect of tenure-squared is negative. Additionally, employees' pay increased as they progressed through the ranks, which is consistent with tournament theory. However, pay overlapped between different levels—indicating that both human capital and position were considered when determining pay.

In recent years, more organizations have placed a heavier emphasis on human capital, also known as intellectual capital. Since human capital cannot be copied by competitors, it provides a “sustainable competitive advantage” for organizations that value human capital investment (SHRM, 2007a, p. 1-84). According to Whitaker and Wilson (2007), accurate human capital measurement can be an even better predictor of future organizational performance than “lag indicators, such as employee attrition or accounting measures” (p. P60). Yet, human capital is difficult to measure (Whitaker & Wilson, 2007). Because of the complexity of evaluating human capital, the Navy is forced to use bonuses and special pays to combat SWO retention or recruiting shortfalls, in lieu of compensating for individual human capital.

2. Wage Theories

a. Efficiency Wage Theory

Organizations employing a “lead the market” strategy offer higher compensation than other companies in the industry to “recruit and retain the most desirable talent from the labor pool” (SHRM, 2007c, p. 4-38). As such, these firms pay efficiency wages, which are above market-clearing wages (Gibbons & Waldman, 1999b). Since civilian companies strive to maximize profits, a firm will choose to set pay at a level in “which the marginal revenues to the employer from a further pay increase equal

the marginal costs” (Ehrenberg & Smith, 2006, p. 370). This high-level pay will provide an incentive for workers to keep productivity high to avoid being fired from their generous company. Initially, employees may not see the incentive for working hard, since they are being paid high wages from day one (Gibbons & Waldman, 1999b). However, over time, if the employer enforces high-performance requirements by firing low-performance employees, the remaining employees will exert high effort and reduce shirking to keep their jobs (Gibbons & Waldman, 1999b).

Generally, “larger firms, more-profitable firms, and capital intensive firms all offer better compensation packages and better working conditions” (Zábojník & Bernhardt, 2001, p. 694). Larger firms and capital intensive firms employ more skilled workers due to the higher technological skills required in the job specifications (Zábojník & Bernhardt, 2001). Additionally, these firms have better opportunities to increase overall and individual productivity, such as exploiting economies of scale in training (Ehrenberg & Smith, 2006). More-profitable firms have the ability to pay higher wages, since their higher-than-average profits can be shared among employees. All three categories of firms value human capital as a competitive advantage, and are willing to pay efficiency wages to acquire it (Sturman et al., 2003).

In a companion study to Baker et al. (1994a), Baker, Gibbs, and Holmstrom (1994b) used the same dataset from a single US firm (but a reduced sample of 50,595 observations) to discuss the firm’s wage policy and salary trends. Figure 22 depicts the mean salary trend over time from the individual firm as compared to the industry average, as gathered from the Current Population Survey (Baker et al., 1994b). The industry average is plotted using the y-axis on the left side of Figure 22, while the sample firm is plotted using the y-axis to the right. Furthermore, to normalize the data, the average salary is displayed in 1988 real dollars (Baker et al., 1994b).

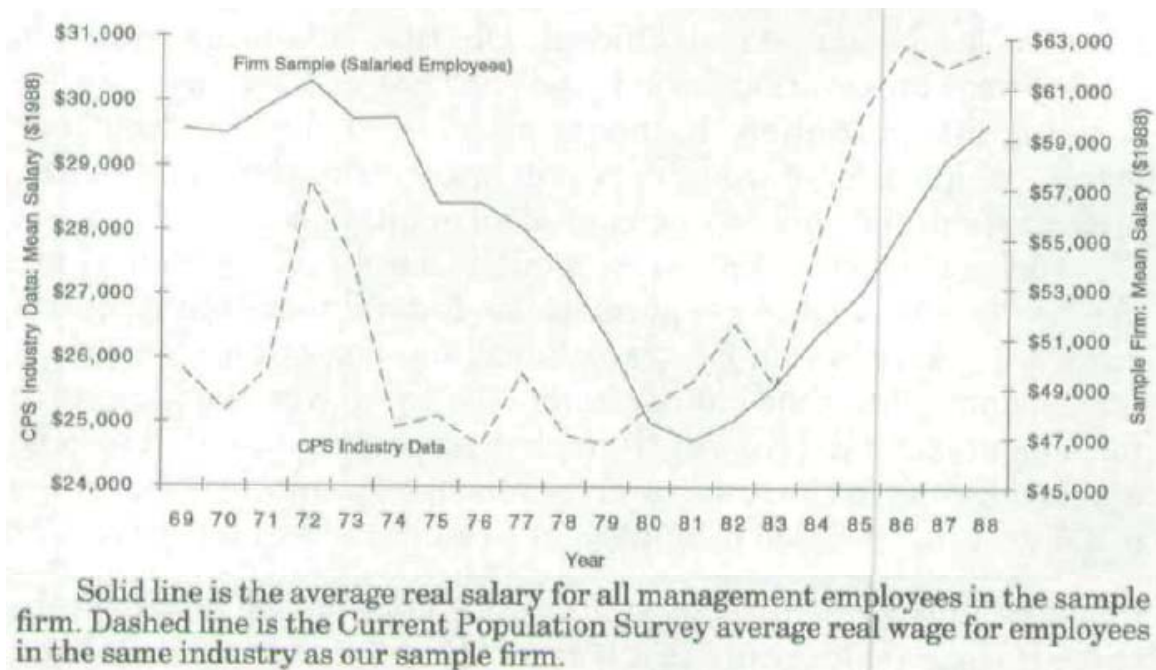


Figure 22. Mean Salary Over Time for the Sample Firm Compared to the Industry Standard
(Baker et al., 1994b)

Though the firm's average salary follows the general industry trend, the average salary is much higher in the sample firm over the time period studied, which suggests the existence of efficiency wages (Baker et al., 1994b). Additionally, Baker et al. (1994b) found evidence of a cohort effect, where incumbent wages follow a pattern of progression over time that differs significantly from entrant wages. As stated by Baker et al. (1994b), "cohorts who earn more on entry maintain their advantage through time [...and] wages are not solely determined by marginal product" of labor (p. 923). This may suggest that employees are satisfied with the efficiency wages and choose to accept the normal career progression and standard annual pay increases, even if they are slightly disadvantaged based on their date of entry.

As one of the largest employers in the United States, the Navy pays officers initial wages that can be considered competitive, depending on the geographical location of the recruits and their level of general human capital. However, the Navy is a non-profit organization, so it is difficult to evaluate if entry-level basic pay is, in fact, based on Efficiency Wage Theory. However, considering the high-level of firm-specific

human capital possessed by senior SWOs and the pay compression of the basic pay table (in which pay at junior ranks is close to pay at more senior ranks, relative to civilian compensation structures), the earlier wages may be efficiency wages to attract talent (Asch & Warner, 2001).

b. Performance-based Compensation as an Incentive

Pay for performance ties rewards directly to metrics of organizational, workgroup, and/or individual performance. Pay-for-performance schemes can be applied to link a reward to a specific output [...] or subjective goal. (Savych, 2005, p. 35)

With the exception of higher pay associated with promotions, the Navy does not yet use performance-based compensation as an incentive (Savych, 2005). Annual performance evaluations (i.e., FITREPS) are not directly tied to officers' compensation; and special and incentive pays do not address the difference in performance between SWOs (Savych, 2005). However, the Defense Advisory Committee on Military Compensation (DACMC) recently recommended that the Department of Defense consider pay reform and the effects of such a system (DACMC, 2006).

Many civilian firms use performance-based compensation systems to create incentives for high performance. For example, Baker et al. (1994b) deduced that their sample firm had an incentive program that recognizes "individual rewards are based on the employee's performance that year" (p. 952). In theory, success is determined by a sequence of interlocking interactions: effort must be directly tied to expected output; certain output must result in a particular outcome; the outcome must be accurately captured in a performance evaluation; and the performance-based component of pay must be determined by the results of the evaluation (Gibbons & Waldman, 1999b). According to Savych (2005), performance-based pay provides a strong performance incentive, as employees increase productivity and work effort if they are subsequently rewarded with higher pay. Furthermore, variable merit-based pay sorts workers into different jobs based on "their abilities and willingness to exert effort" (Savych, 2005, p. 36). Higher-performing employees prefer jobs that have performance-based aspects of their

compensation plan, since their work effort is rewarded (Savych, 2005). Lower-performing employees prefer jobs with guaranteed steady wages, since relative wages remain constant across all performance levels. Therefore, in internal labor markets, performance-based compensation systems screen poor-performing employees during “ports of entry” and ports of exit through self-selection (Rosen, 1992, p. 227).

A negative aspect of individual performance-based compensation is that workers may allocate more effort to activities that are directly recorded in performance evaluations, thereby removing effort on normal work activities that have little impact on individual evaluation yet are important for the success of the company (Ehrenberg & Smith, 2006). Since personnel budgets are limited, pay is relatively distributed among employees. This constraint of resources may cause competition among employees, which, if left unchecked, may lead to a negative workplace environment. Additionally, financial incentives are often “not formally tied to one’s own performance,” since accurately capturing performance is quite difficult (Gibbons & Waldman, 1999b, p. 2,386). Instead, many civilian firms pay variable bonuses that encapsulate overall firm performance and resemble profit sharing plans, which barely reflect individual performance.

3. Tournament Theory

a. Promotion Tournaments

According to Lazear and Rosen (1981), promotion tournaments offer incentives within firms and other organizations. In the SWO community, officers compete with their peers for promotions, as the Navy’s promotion process restricts the number of SWOs promoted in a given fiscal year through promotion zones and limitations imposed by promotion opportunity. As stated by Warner and Asch (1995):

In the [Navy], the reward for effort is promotion. In the junior ranks, promotion is based on individual skill acquisition. But beyond the junior ranks, the promotion system resembles a contest or tournament in which only a fraction of those eligible for promotion are actually selected. (p. 381)

Therefore, the SWO promotion system follows the promotion tournament theory for promotion to Lieutenant Commander (O-4) and senior ranks. According to Ehrenberg and Smith (2006), promotion tournaments have three important components:

Who will win is uncertain, the winner is selected based on relative performance (that is, performance compared with that of the other ‘contestants’), and rewards are concentrated in the hands of the winner so that there is a big difference between winning and losing (p. 376).

By holding SWO promotion boards that independently make promotion decisions, promotions are not always certain, especially when the selection rate decreases as the seniority of rank increases. Additionally, naval officers are selected based on the quality of their service records, which indicates relative performance as compared to their peers being considered at the same promotion board. Though Surface Warfare Officers do not know exactly who will be selected for promotion each year, most officers understand methods for improving the quality of their own service records. These methods include increased performance, greater responsibility, larger breadth of work, additional qualifications, and further education. Finally, SWOs selected for promotion are provided financial rewards, higher authority, and greater responsibility afforded by the next higher rank. Furthermore, the “up-or-out” rules in the military amplify the rewards of promotion, since officers selected for promotion to certain ranks earn the right to remain in the military longer than those who do not promote (Asch & Warner, 2001, p. 525). For instance, Commanders (O-5) currently reach mandatory retirement at 28 years of service unless they are promoted to Captain (O-6) prior to their 28th year, which authorizes an extension on active duty past 28 years of service (Secretary of the Navy, 2005).

Most civilian companies apply tournament theory to reward and motivate managers and executives. In a comprehensive study, Bognanno (2001) examined pay and promotion in civilian corporations by analyzing a database containing over 600 firms, beginning in the year 1981 through 1988. To isolate the tournament effects at the highest hierarchical levels, Bognanno (2001) only studied data for executives who comprised the top four hierarchical levels in their respective organizations, which

included 73,062 executives. Two ordinary least squared (OLS) regressions were run to provide a baseline for analysis. Bognanno's (2001) three subsequent regressions respectively controlled for:

- Firm fixed effects
- Firm and individual fixed effects using years in current job
- Firm and individual fixed effects using years in the same job before promotion to the next highest level.

Table 11 contains the regression results of Bognanno's (2001) study, including coefficients and t-statistics (in parentheses) for each independent variable. The dependent variable in all regressions was the natural logarithm of compensation, which contained salary and bonuses earned (Bognanno, 2001).

Table 11. Regression Results of the Natural Log of Compensation on Hierarchical Level and Individual Characteristics, with and without Firm and Individual Fixed Effects
(Bognanno, 2001, p. 295)

	Dependent Variable: ln(Salary + Bonus)				
	OLS (1)	OLS (2)	Firm Fixed Effect (3)	Firm and Individual Fixed Effects (4)	Firm and Individual Fixed Effects (5)
Intercept	6.8258	6.7705			
Level 1: CEO	1.5128 (121.3)	1.5024 (122.1)	1.5984 (169.9)	.1728 (11.6)	.2425 (14.9)
Level 2: Reports directly to CEO	.6454 (111.6)	.6437 (113.1)	.7520 (168.7)	.0397 (7.3)	.0559 (11.9)
Level 3: Reports to level-2 executive	.2073 (53.9)	.2099 (55.5)	.2727 (92.0)	.0106 (3.5)	.0145 (5.9)
Age	.1139 (55.8)	.1136 (52.7)	.0781 (46.6)	.1343 (45.7)	.1346 (45.9)
Age ²	-.0009 (43.9)	-.0009 (41.9)	-.0007 (37.5)	-.0008 (28.6)	-.0008 (28.7)
Education	.0595 (60.5)	.0662 (67.1)	.0242 (30.1)	.0010 (.3)	.0013 (.4)
1 = hired into job; 0 = promoted into job		-.0453 (7.9)	-.0034 (.8)	-.0424 (7.9)	-.0427 (7.9)
Tenure		.0048 (6.3)	.0029 (5.0)		
Tenure ²		.0001 (2.8)	.00004 (2.5)		
Years in current job		-.0221 (22.9)	-.0144 (19.1)	-.0019 (2.5)	-.0027 (3.9)
(Years in current job) ²		.0004 (7.5)	.0003 (8.4)	-.0004 (7.9)	-.0003 (5.6)
Years in current job for level 1; 0 for others				.0128 (7.7)	
Years in current job for level 2; 0 for others				.0006 (.6)	
Years in current job for level 3; 0 for others				-.0001 (.1)	
Years in the same job be- fore promotion to level 1; 0 for others.					-.0182 (4.5)
Years in the same job be- fore promotion to level 2; 0 for others.					-.0064 (6.0)
Years in the same job be- fore promotion to level 3; 0 for others.					-.0026 (4.1)
N	73,062	73,062	73,062	73,062	73,062
R ²	.43	.45	.69	.98	.98

Testing for wage differentials among the hierarchical levels, Bognanno (2001) found that promotion to each level predicts an increase in salary, which acts as the reward from winning the promotion tournament. For example, after controlling for firm fixed effects, an increase from Level 4 to Level 1 (CEO) raised pay by 159.84 percent; an increase from Level 4 to Level 2 raised pay by 75.2 percent; and an increase from Level 4 to Level 3 raised pay by 27.27 percent (Bognanno, 2001). However, controlling for both firm and individual fixed effects, the wage differential between Level 4 executives and CEOs were significantly reduced to either 17.28-percent (using dummy variables for years in current job) or 24.25 percent (using dummy variables for years in the same job before promotion to the next level). Additionally, after controlling for firm and individual fixed effects, Bognanno (2001) found that the number of years that executives remained in their current job decreased pay by 1.82 percent at Level 1, 0.64 percent at Level 2, and 0.26 percent at Level 3. According to Bognanno (2001), this negative trend suggests that executives value periodic promotions to keep annual pay from losing real-dollar value over time.

A criticism to Bognanno's (2001) methodology is that the OLS regressions did not include performance metrics. By excluding performance, this effect was left in the error term of the regressions, thereby causing omitted variable bias and perhaps violating the zero-conditional mean assumption (Wooldridge, 2006). Despite this bias, Bognanno's (2001) study provided further empirical evidence of the prerequisite conditions of promotion tournaments, including "(1) a relatively high rate of promotion from within; (2) pay gaps that increase with hierarchical level; (3) hierarchical levels that serve as an important determinant of pay; and (4) large rewards (in present value terms) from promotion" (p. 310).

Though a high rate of internal promotion is essential for promotion tournaments, individual promotion speed can act as a signaling device to outside employers (Huang, Lin, & Chuang, 2006). Fast promotion suggests a high level of individual ability, talent, and productivity (Huang et al., 2006). Since outside employers value these traits, they may try to recruit such stellar workers, which may lead to a high turnover rate of talent in the current company. This threat strengthens the firm's need for

a rewards scheme for promotion and a performance-based component in the compensation system in order to create an incentive for high-performing employees to stay.

b. Risk Taking in Tournaments

Most literature assumes participants in promotion tournaments are either risk-neutral or risk-adverse workers (Gibbons & Waldman, 1999b). In reality, the level of risk taking is different among workers participating in tournaments. As such, some workers have flexibility in selecting projects or jobs, based on their perceived relative risk (Hvide, 2002). For Surface Warfare Officers, particular jobs are associated with certain risk (such as job assignments in which work is taxing), yet rewards for success are high (i.e., increased probability of promotion). Provided with an assignment choice, officers can either take:

- A relatively easier job assignment and not work to their full potential to accomplish the mission
- A tougher job assignment and work to their full potential, thereby bearing the risk of either accomplishing the mission or failing to achieve success (depending on the match between ability and task).¹⁸

This important decision depends on the level of risk a SWO is willing to take. Risk-adverse officers tend to choose the first option, while risk-seeking officers would probably select the second option. True risk-neutral officers have no preference either way. However, it is unclear if SWOs possess the prerequisite knowledge of the job assignments to make an informed decision. Even if armed with the career-impacting information, officers' decisions for assignment include other factors: duty location, length of the tour, and family requirements.

In civilian companies in which incentives are directly tied to performance, employees compete with coworkers for both performance-based pay and promotions. In the context of motivation for risk taking, Hvide (2002) proposed:

¹⁸ Not all SWO job assignments are mutually negotiated between detailing or placement officers and the officer receiving the job assignment (i.e., SWOs do not have a choice in all job assignments).

In tournaments where risk taking is an option, the principal gets what he does not pay for. Rewarding a high relative performance yields low levels of effort and expected output, while rewarding a ‘mediocre’ relative performance yield high levels of effort [...] Although risk taking is not necessarily harmful in itself, high risk taking is associated with low effort, which is harmful to production. Hence, if the reward to CEOs depends strongly on how well its firm performs as compared with other firms in an industry, for example, through bonus plans anchored in relative performance, the CEOs in the industry take high risks and put in low work effort in equilibrium.¹⁹ (pp. 892-893)

If the strongest performers with an elevated level of productivity are highly rewarded, then other workers are persuaded to take risks to compensate for the disparity (Hvide, 2002). If the propensity for risk taking among workers is extremely high, negative implications for the firm may arise, since “high risk taking is associated with low effort” (Hvide, 2002, p. 892). Hvide (2002) claims that Chief Executive Officers (CEOs), who are compensated relative to the performance of their firms, tend to be risk takers and provide “low work effort in equilibrium” (p. 892). On the other hand, if the highest reward is awarded to the “mediocre” performer, then other workers will be motivated to take low risks and be highly productive (Hvide, 2002). Again, this concept is best illustrated by CEOs. According to Hvide (2002), CEOs who provide a moderately high level of output (e.g., “mediocre” performance) through hard work and low risk taking should be rewarded at the highest reward level to provide incentives for other CEOs to follow (p. 892). Nevertheless, this relationship seems to fit only the highest-level of management, which may only be relevant for flag officers (i.e., Admirals) in the Navy.

c. Weaknesses of Promotion Tournaments

Though promotion tournaments can be used as effective tools for motivating employees to work at their full potential, tournaments may also “discourage cooperation among co-workers” (Gibbons & Waldman, 1999b, p. 2392; Lazear & Rosen, 1981). Workers “may allocate effort away from increasing their own output and toward

¹⁹ Hvide (2002) defines “mediocre” as a moderately high level of output (p. 892).

reducing the output of others” (Ehrenberg & Smith, 2006, p. 377). If not kept in check by the firm, this incentive to sabotage coworkers can lead to overall decreased productivity in the firm, since the allocation of effort is not efficient (Savych, 2005). Additionally, the threat of sabotage undermines the principles of organizational cooperation and teamwork, creating a hostile working environment where employees are always cautious of some workers and do not trust others (Savych, 2005).

To combat this problem inherent to promotion tournaments, many firms use wage compression in their pay system (Gibbons & Waldman, 1999b). This pay compression keeps relative wages similar between the different hierarchical levels in the firm, resulting in a possible overlap in pay between levels. However, the overlap reduces the effectiveness of tournaments since rewards for promotion are relatively small between the winners and losers in the tournament (Ehrenberg & Smith, 2006). Pay compression can be further amplified if tenure is used in the pay equation. For instance, a prior-enlisted Navy Lieutenant (O-3E) with 18 years of total service earns \$5,916 per month in basic pay, while a Lieutenant Commander (O-4) with 11 years of service earns basic pay of \$5,799 monthly (Under Secretary of Defense for Personnel and Readiness, 2008a). Therefore, the tenure dimension (e.g., years of service) of the basic pay table creates the possibility for a lower-ranking Surface Warfare Officer to earn higher wages than a more senior SWO. This pay compression is exacerbated by the addition of retention bonuses in the junior officer ranks compared to the compensation of more senior officers whose tenure precludes eligibility for many of these bonuses.

Furthermore, employees on the fast track may interfere with the efficiency of the promotion tournament, since the probability of fast track employees winning the promotion is much higher than those employees not on the fast track (Baker et al., 1994a). Within this context, the probability of winning can be reasonably estimated by all employees, and provides a disincentive for employees not on the fast track to continue participating in the promotion tournament. Additionally, fast track employees are often identified early; thus, relative performance is only judged at lower-levels, and subsequent promotions may be based on the potential to succeed at the next higher position (Baker et al., 1994a). The Navy’s promotion of some SWOs who are “below zone” suggests a fast

track in the SWO community (Secretary of the Navy, 2006, pp. 8-9). However, the likelihood that officers on the fast track will remain there for their entire careers is minimal, since officer promotion is limited by promotion zones and time-in-grade requirements.

4. Employee Performance, Turnover, and Pay Relationships

a. “Curvilinear” Relationship in a Civilian Firm

In reference to civilian organizations, Trevor et al. (1997) proposed a relationship between performance and employee turnover that is “curvilinear,” such that turnover is more probable for high performers as well as low performers (p. 45). It was hypothesized that average performers would have a higher probability of remaining with their current employers. The logic behind the “curvilinear” theory is that higher performers will promote at a higher rate, thereby signaling higher ability and an increased propensity to leave and seek better employment elsewhere (Trevor et al., 1997). For lower performers, the theory predicts either poor employee-job matching or poor employee-organization matching, as lower-performing workers are more likely to voluntarily quit or be fired (Trevor et al., 1997). This “curvilinear” relationship can be seen in the parabolic-shaped graph created by plotting the survival probability against performance level (as depicted in Figure 23 and Figure 24).

By using personnel records from 1983 through 1988 for 5,143 exempt employees in a single petroleum firm, Trevor et al. (1997) employed a proportional hazards model to estimate the conditional probability of employee turnover as a function of tenure, salary, demographic variables, average performance rating, average annual salary growth, and number of promotions. The hazard function estimates the probability of exiting conditional on employees surviving up to the starting time of the observation period (t). The survival function is the probability of surviving past time t (Trevor et al., 1997). All employees were categorized by their average performance ratings on a scale of 1.0 through 5.0 in increments of 0.5 points. As hypothesized, Trevor et al. (1997) found that both poor performers (1.0 rating) as well as top performers (5.0 rating) had

statistically significant lower probabilities of retaining when compared to the average performer (3.0 rating). As depicted in Figure 23, this relationship was consistent for different tenure lengths: three, four, and five years from initial hire.

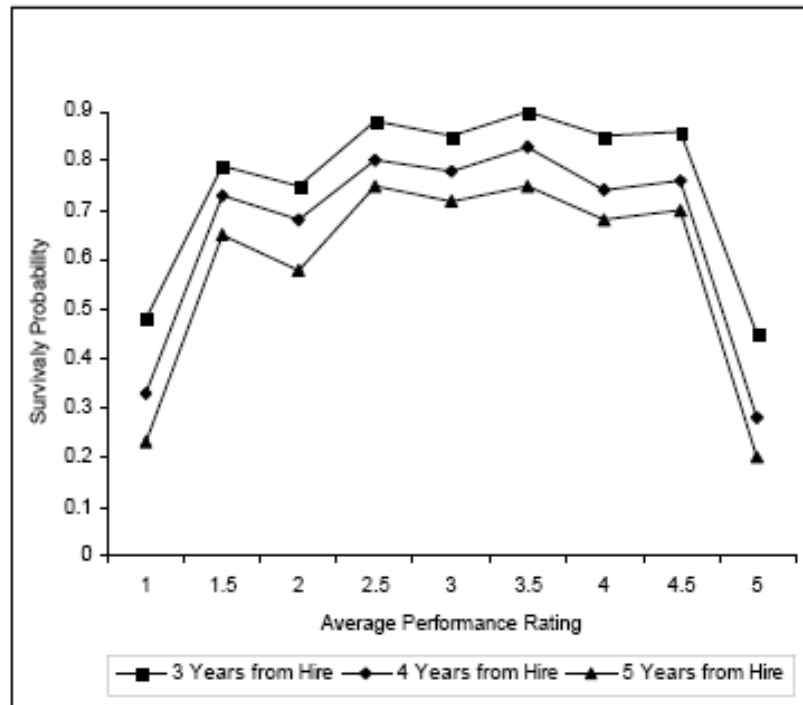


Figure 23. Curvilinear Relationship of Survival Probability and Average Performance Rating by Tenure as Measured in Years from Initial Hire (Trevor et al., 1997, p. 52)

Additionally, Trevor et al. (1997) hypothesized that positive salary growth will negatively impact turnover, which will be most pronounced at the highest performance levels. If high-performing employees are paid relatively higher salaries by their current employer, they have little incentive to quit (Sturman et al., 2003). By using an interaction variable for salary growth and performance and an interaction term for promotion and performance in the proportional hazards model, Trevor et al. (1997) found statistical evidence that salary growth has a negative impact on the probability of exit, as shown in Figure 24.

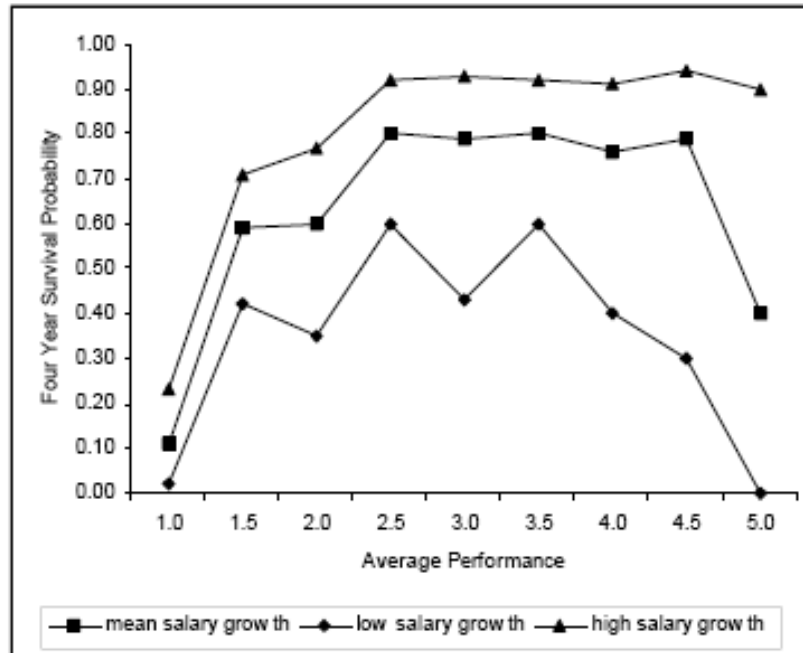


Figure 24. Curvilinear Relationship of Survival Probability and Average Performance Rating by Level of Salary Growth (Trevor et al., 1997, p. 57)²⁰

Figure 24 implies that if high performers are not compensated adequately (i.e., low salary growth), then the disparity will lead to a low survival probability at all performance levels. However, if salary growth were to remain relatively close to mean salary growth, it is more likely for high performers to retain, as the survival probability is predicted to be approximately 0.40 for 5.0 performers. Furthermore, if high performers receive high salary growth, their probability of staying increases further (survival probability of approximately 0.90 for 5.0 performers).

Finally, Trevor et al. (1997) hypothesized that when salary growth is held constant, promotions will be positively related to turnover based on signaling theory. Nine separate proportional hazard regression models were run to examine the effects of salary growth and promotions on turnover at each average performance level. Along with the number of observations used in each regression, the resultant coefficients for salary growth and promotion independent variables are displayed in Table 12.

²⁰ Low salary growth is one standard deviation below the mean salary growth, and high salary growth is one standard deviation above the mean (Trevor et al., 1997).

Table 12. Proportional Hazard Regressions of Voluntary Turnover on Average Annual Salary Growth and Average Annual Promotions, for Each Average Performance Category
(Trevor et al., 1997, p. 56)

Average performance level	Coefficient		No. of observations
	Salary growth	Promotions	
1.0	-0.26*	1.30**	60
1.5	-0.29*	1.36**	97
2.0	-0.47****	0.68****	1,171
2.5	-0.62****	0.39*	1,090
3.0	-0.89****	0.15	1,667
3.5	-0.67****	0.20	672
4.0	-0.79****	-0.96	317
4.5	-1.16***	-0.22	46
5.0	-1.24****	-0.16	23

Note. At each performance category, the equation includes salary growth, promotions, salary level age, and marital status. Performance ranges from 1 = lowest to 5 = highest.
* $p < .10$. ** $p < .05$. **** $p < .001$.

According to Table 12, holding salary growth constant, promotions have a statistically significant coefficient for the bottom three performance levels, though the 2.5 performance level has only a weak statistical significance at the 10-percent level (Trevor et al., 1997). Therefore, promotions are only positively related to turnover in the lower spectrum of the performance scale. Additionally, holding promotion constant, salary growth has a statistically significant negative effect on turnover for every performance category (Trevor et al., 1997). Therefore, higher pay increases (based on performance) improve the likelihood that employees will stay with the organization (Trevor et al., 1997).

Though the Trevor et al. (1997) study was enlightening, the methodology had three distinct flaws. First, the regression models may have omitted important variables that further explain turnover, such as industry experience (not just tenure with the firm) and employee education level, which may have caused omitted variable bias in the study. Second, the zero-conditional mean assumption was violated, since worker ability was likely captured in the residual of the regression. Ability is probably correlated with salary growth, performance, and promotions, therefore yielding a positive bias. A better-defined proxy for ability could have satisfied this assumption. Third, the authors

provide little explanation for the retention decision's correlation with wage growth. Trevor et al. (1997) suggest that workers prefer rising wage profiles; in other words, firms should start new employees with low wages and gradually increase wages over time based on tenure. This logic is counterintuitive since employees would have little incentive to join such firms, when they have the opportunity to earn higher wages elsewhere.

b. U.S. Department of Defense Government Employees

Using similar theoretical constructs as Trevor et al. (1997), Gibbs (2006) examined variables that predict the probability of voluntary turnover of US Department of Defense government employees. Gibbs (2006) developed linear probability regression models in which the probability of exiting was the dependent variable, and the independent variables included education, a dummy variable for performance (equal to 1 if an employee's most recent performance rating was the best possible), year, demographic variables, and interaction variables. Gibbs' (2006) sample included:

- 315,401 General Schedule (GS) employees in Grades 11 through 15
- 110,689 Performance Management and Recognition System (PMRS) employees in Grades 13 through 15
- 28,254 China Lake employees in Grades 2 through 4.²¹

After dividing the sample by pay plan and pay grade, Gibbs (2006) conducted eleven separate linear probability models to predict employee exits, as shown in Table 13.

²¹ Both PMRS and China Lake employees were governed by pay systems that rewarded performance. Under the PMRS, employees had similar grades as the GS system but also "competed for merit increases based on performance evaluations" within each grade (Gibbs, 2006, p. 202). At the Naval Weapons Center at China Lake, California, government employees fell under an experimental pay plan that included flexible personnel and pay management. Conversely, GS employees only received step pay increases within each grade based solely on tenure. (Gibbs, 2006)

Table 13. Linear Probability Models Predicting Employee Exits
(Gibbs, 2006, p. 212)

		Grade 11	Grade 12	Grade 13	Grade 14	Grade 15
GS	Salary growth	0.3809	-11.3406***	-18.7958***	13.9805	-51.1636*
	Salary growth × year	-0.0002	0.0057***	0.0095***	-0.0070	0.0257*
	Rating = 1	-3.2438	-0.0814	0.9473	2.0024	-1.8610
	(Rating = 1) × year	0.0016	0.0000	-0.0005	-0.0010	0.0009
	MA	-0.8444	0.9136**	0.9210**	0.1540	1.1349
	MA × year	0.0004	-0.0005**	-0.0005**	-0.0001	-0.0006
	PhD	-7.4335	3.4435***	1.1515*	1.1945	0.2383
	PhD × year	0.0038	-0.0017***	-0.0006*	-0.0006	-0.0001
	<i>n</i>	49,008	178,829	67,241	17,647	2,676
		Grade 13	Grade 14	Grade 15		
PMRS	Salary growth	7.4148	-22.0674***	-1.6888		
	Salary growth × year	-0.0037	0.0111**	0.0009		
	Rating = 1	3.4691**	1.1680	1.0966		
	(Rating = 1) × year	-0.0017**	-0.0006	-0.0005		
	MA	-0.9189	-0.1084	-0.0518		
	MA × year	0.0005	0.0001	0.0000		
	PhD	3.3746***	2.8228***	2.0621***		
	PhD × year	-0.0017***	-0.0014***	-0.0010***		
	<i>n</i>	42,616	43,872	24,201		
		Grade 2	Grade 3	Grade 4		
China Lake	Salary growth	33.8822	3.2549	-41.9922		
	Salary growth × year	-0.0170	-0.0016	0.0211		
	Rating = 1	9.3007	7.9809**	7.2429**		
	(Rating = 1) × year	-0.0047	-0.0040**	-0.0036**		
	MA	-8.6546	1.6848	1.4105		
	MA × year	0.0044	-0.0008	-0.0007		
	PhD	-6.9591	5.8609***	-0.5445		
	PhD × year	0.0035	-0.0029***	0.0003		
	<i>n</i>	2,548	20,122	5,584		

GS = General Schedule; PMRS = Performance Management and Recognition System.

***significant at 1%; **significant at 5%; *significant at 10%. See text for regression specifications.

According to Table 13, the coefficients for performance rating dummy variables for Grade 3 and Grade 4 at China Lake had large positive values (7.9809 and 7.2429 respectively) and were statistically significant at the 5-percent significance level. These results indicate that receiving the highest performance rating on the most recent performance evaluation will drastically increase the probability of leaving the organization. Furthermore, the statistically significant negative interaction term of rating and year shows that the effect diminished over time. The effect of performance on the probability of exit was not statistically significant for the other pay plans and pay grades, with the exception of Grade 13 under the PMRS pay plan in which high performance

predicts an increased probability of leaving (Gibbs, 2006). Additionally, Gibbs (2006) reasoned that “the regressions show no substantial difference between exits and stays in quality or performance” (p. 211).

The specificity of the sample in Gibbs’ (2006) study may have uncovered some self-selection bias as well, since most Department of Defense scientists and engineers have specific skill sets that may not be transferable to the civilian labor market, but which increased their probability of retention in the federal government. Furthermore, graduate degrees are probably obtained by higher ability workers, which means this sample of government employees may not be representative of the population of the federal workers.

c. Theoretical Utility Analysis

As an extension of the work started by Trevor et al. in 1997, Sturman et al. (2003) conducted a cost-benefit analysis to evaluate the utility of performance-based compensation. In this study, the authors compared the costs of retaining talent to the benefits the organization receives from retaining them. In an aggregate database, Sturman et al. (2003) consolidated:

1. Employee record data from the study by Trevor et al. (1997) to calculate turnover probabilities
2. Data from the Bureau of Labor Statistics and the WorldatWork 2002 survey for pay levels and benefit costs
3. Other pertinent data from published research studies to estimate the cost of turnover and the value of different levels of employee performance.

The methodology used by Sturman et al. (2003) is shown in Figure 25.

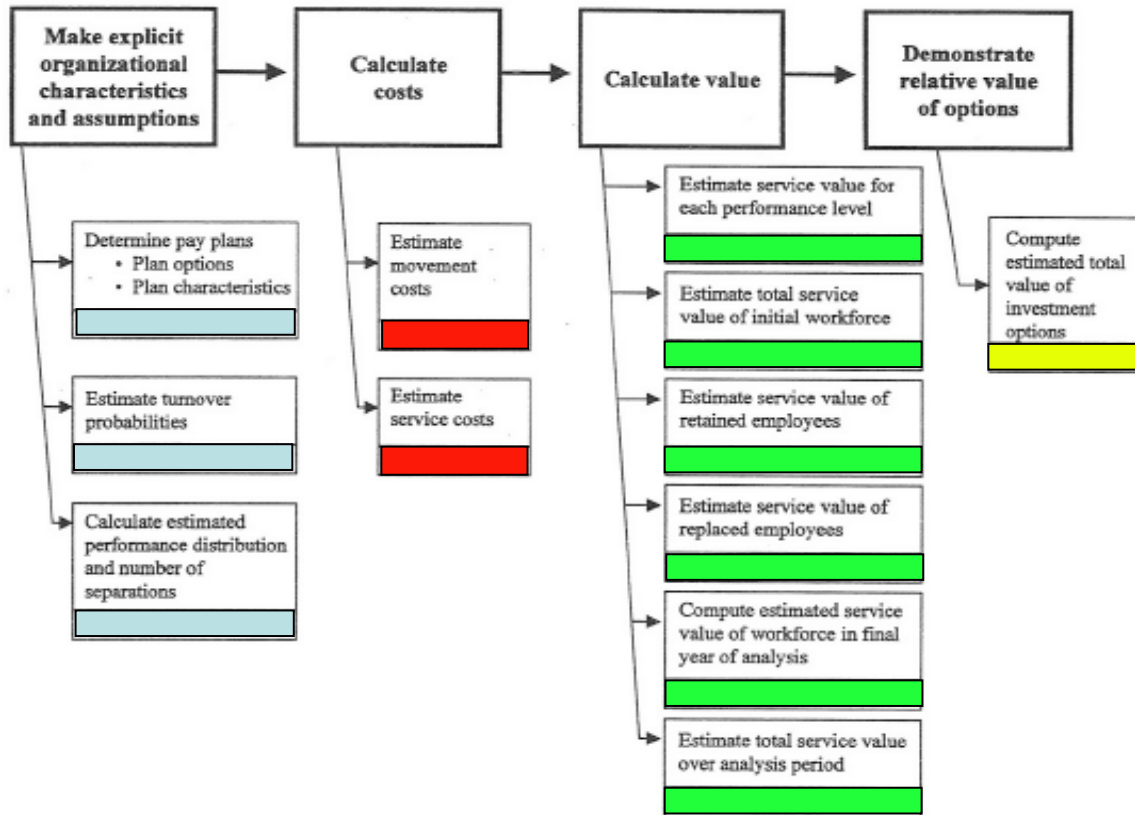


Figure 25. Flow Chart of Utility Analysis Methodology (Sturman et al., 2003, p. 1002)

Sturman et al. (2003) devised three theoretical pay strategies for utility analysis. In Pay Strategy 1, all employees receive the same average pay increase of 4 percent without a link to performance. Pay Strategy 2 is a performance-based system where above-average performers (i.e., greater than 3.0 ratings on a 5.0 scale) receive larger pay increases, and below average performers receive the 4-percent base pay increase. Pay Strategy 3 continues to pay above-average performers higher-than-average pay increases, but pay increases decline as the performance level decreases for below-

average performers. In Table 14, Sturman et al. (2003) compared the utility of the three different pay strategies under three different deviations relative to the average performer.²²

Table 14. Utility Analysis Results of Different Pay Strategies at Three Different Deviation Categories
(Sturman et al., 2003, p. 1026)

Computation of 4-Year Investment Value of Different Pay Strategies (in \$Millions)									
	Service value (in \$Millions)	–	Service costs (in \$Millions)	–	Movement costs (in \$Millions)	=	4-Year value (in \$Millions)	Difference from Pay Strategy 1	% Change from Pay Strategy 1
<i>SD_y = 30%</i>									
Pay Strategy 1	\$1,931.43		\$1,495.89		\$154.67		\$280.87	–	–
Pay Strategy 2	\$1,940.62		\$1,509.66		\$142.05		\$288.91	\$8.04	2.86%
Pay Strategy 3	\$1,958.25		\$1,492.95		\$181.80		\$283.50	\$2.62	0.91%
<i>SD_y = 60%</i>									
Pay Strategy 1	\$1,955.02		\$1,495.89		\$154.67		\$304.46	–	–
Pay Strategy 2	\$1,973.40		\$1,509.66		\$142.05		\$321.69	\$17.22	5.66%
Pay Strategy 3	\$2,008.66		\$1,492.95		\$181.80		\$333.91	\$29.44	9.15%
<i>SD_y = 90%</i>									
Pay Strategy 1	\$1,978.61		\$1,495.89		\$154.67		\$328.05	–	–
Pay Strategy 2	\$2,006.17		\$1,509.66		\$142.05		\$354.46	\$26.41	8.05%
Pay Strategy 3	\$2,059.06		\$1,492.95		\$181.80		\$384.31	\$56.26	15.87%

According to Table 14, the total four-year investment values were estimated by subtracting both service costs and movement costs from the service values (Sturman et al., 2003). This utility analysis indicates that Pay Strategy 2 yielded the highest 4-year value in the “SD_y=30%” category, and Pay Strategy 3 yielded the highest 4-year value in both the “SD_y=60%” and “SD_y=90%” categories. For all three deviation categories, a performance-based strategy yields a higher net value than the control strategy in which there is no performance-based component (Sturman et al., 2003). Therefore, performance-based pay systems proved to be valuable investments in this theoretical analysis. The Navy may benefit from establishing a performance-based pay system than rewards higher performers by higher annual pay raises and punishes low performers by encouraging voluntary turnover (Sturman et al., 2003).

²² Sturman et al. (2003) developed three deviation categories: SD_y=30%, SD_y=60%, and SD_y=90%. Respectively, these categories suggest that “an employee performing better than 84% of the employee population is worth 30% of salary, 60% of salary, or 90% of salary more to the organization than an average performer (i.e., someone performing at the 50th percentile) in the same job” (Sturman et al., 2003, p. 1018).

Sturman et al. (2003) provided an excellent framework for an actual firm-specific utility analysis; however, the data used in the study was gathered from multiple sources and was purely hypothetical. Also, employee performance was assumed to remain constant from 2003 through 2007, which may be a bad assumption since performance likely fluctuates over time. The utility analysis also excluded administrative and other miscellaneous labor costs from the overall calculations, which may have created a positive bias in the results. Finally, the SD_Y approach assumes a normal distribution of performance, which may be highly unlikely if performance scores are skewed due to “grade inflation” or leniency error (Bjerke, Cleveland, Morrison, & Wilson, 1987, p. 1).

C. ORGANIZATIONAL BEHAVIOR

In the context of motivating individual and organizational behavior, whether focusing on Surface Warfare Officers or civilian managers, two questions with a variety of answers exist:

- What is the basis of human motivation?
- “[W]ho am I serving?” (Herzberg, 1979, p. 60)

Human motivation, as explained by SHRM (2007b), illustrates three fundamental principles of human behavior that elucidate an individual’s actions:

1. Human behavior is caused, meaning there is a reason for each action.
2. Behavior is goal-oriented, meaning action is not random.
3. Each person is unique (due to upbringing and genetics, no two people are alike).

In the workplace, a tangible employee-employer relationship influences organizational behavior. This relationship affects future retention decisions and initially influences an individual’s decision to join an organization by laying the foundation of employee-employer fit. Various theories and principles provide perspective on developing this working relationship and offer further explanation of the workplace

environment. Aspects of the following seven theories explain employee motivation and lay the foundation for performance-based compensation in organizations, including the SWO community:

- Maslow's Needs Hierarchy Theory
- Behavioral Reinforcement Theory
- Agency Theory
- Herzberg's Motivation-Hygiene Theory
- Management Philosophy Theories
- Expectancy Theory
- Equity Theory

1. Maslow's Needs Hierarchy Theory

Individual behavior is an amorphous concept. How does one influence behavior? What contributes to individual behavior? How do employers maximize employee behavior? These important questions comprise the foundation of the employee-employer relationship. McShane and Von Glinow (2007) describe the MARS (motivation, ability, role perceptions, and situational factors) Model, which explains individual behavior. Motivation is defined as what voluntarily drives an individual in a particular direction at a desired level of intensity. Ability represents someone's talent and learned skills, such as particular skill sets used to perform tasks. Role perceptions define the employee-job fit, which is how a worker fits into the workplace. In addition, situational factors include the surrounding environment and extraneous interactions that impact a particular individual. (McShane & Von Glinow, 2007)

Maslow's Needs Hierarchy, as depicted in Figure 26, further explains the components that influence individual motivation. Decisions that affect day-to-day matters as well as the employer-employee relationship stem from earlier research on motivation. In describing Maslow's Needs Hierarchy, McShane and Von Glinow (2007) explained that:

Motivation begins with individual needs and their underlying drives. Needs are deficiencies that energize or trigger behaviors to satisfy those needs. Unfulfilled needs create a tension that makes us want to find ways to reduce or satisfy them. The stronger your needs, the more motivated you are to satisfy them. Conversely, a satisfied need does not motivate. Drives are instinctive or innate tendencies to seek certain goals or maintain internal stability. Drives are hardwired in the brain—everyone has the same drives—and they most likely exist to help the species survive. (p. 92)

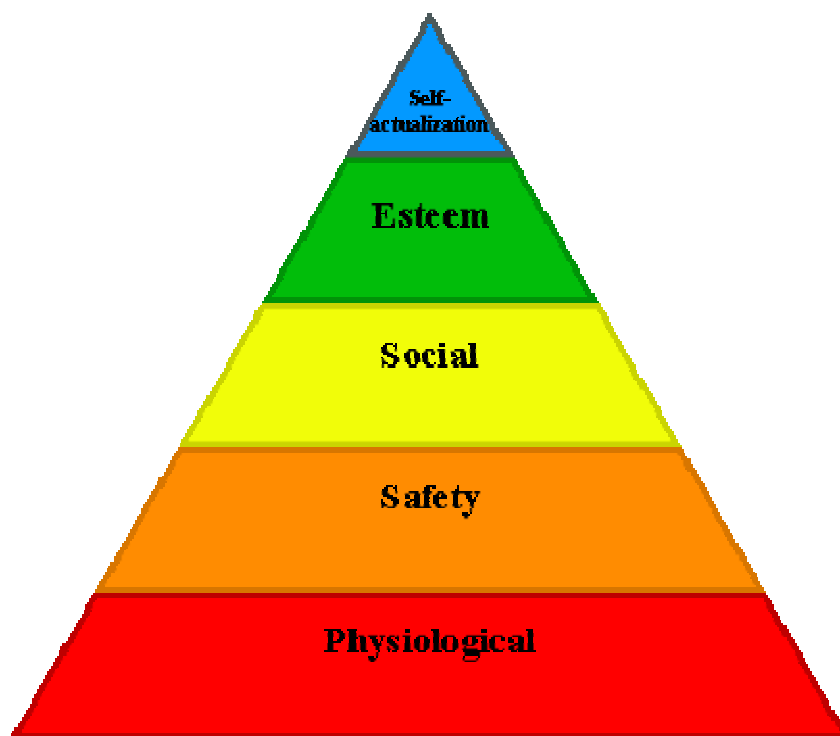


Figure 26. Maslow's Needs Hierarchy
(Adapted from McShane & Von Glinow, 2007, p. 93)

Maslow's Needs Hierarchy categorizes all basic needs into five levels: physiological, safety, social, esteem, and self-actualization. Physiological needs satisfy the essential needs for survival: air, food, water, sex, and shelter (SHRM, 2007b). Safety is the next higher need; a stable environment and the absence of pain, illness, or threats encompass the safety need. Social interaction comprises the need for love and affection, which satisfies the social need. The next level is the need to satisfy self-esteem through

personal accomplishments as well as recognition and respect from others. The need for self-actualization or self-fulfillment is located at the top of the needs hierarchy. Self-actualization represents the need to reach an individual's full potential. Though individuals may be motivated by several needs at once, the lowest-level need is the primary motivator until it is completely satisfied. Lower-level needs must be fulfilled before an individual moves to the next higher need in the hierarchy. However, self-actualization is never fully satisfied; it can only be momentarily fulfilled. (McShane & Von Glinow, 2007)

Maslow's Needs Hierarchy Theory has not been universally accepted, but the fundamentals of satisfying personal needs remain the foundation for individual and organizational behavior (McShane & Von Glinow, 2007). Just as workers modify their behavior to satisfy certain needs, organizations function in a similar fashion. Though the needs structure may vary for individuals and organizations based on values or particular goals, individuals must satisfy the lowest unfulfilled level prior to attaining the next higher need. Applying Maslow's Needs Hierarchy Theory to organizational behavior among Surface Warfare Officers is no different. SWOs seek to fulfill their basic needs en route to self-actualization. They achieve this through on-time or early promotion to the next higher rank, thereby fulfilling their rank potential. According to Maslow's Needs Hierarchy, once one rank is achieved, the goal is only momentarily satisfied as the quest for self-actualization continues. Until a SWO becomes the Chairman of the Joint Chiefs of Staff, there will always be a higher promotion goal which can motivate behavior.

2. Behavioral Reinforcement Theory

Further explanation of individuals' actions beyond the theoretical influence of Maslow's Needs Hierarchy is provided by behavioral reinforcement theory. Also known as operant conditioning or modification theory, Behavior Reinforcement Theory "explains learning in terms of the antecedents and consequences of behavior" (McShane & Von Glinow, 2007, p. 55). Simply stated, an understanding of how employees learn can provide employers valuable information in determining the best method to influence

and maximize employees' work activities. The goal is to reinforce the activities that achieve positive results and to either ignore or eliminate the actions that are counterproductive.

McShane and Von Glinow (2007) recognized that three principles form the basis of Behavior Reinforcement Theory:

1. Antecedents—the events that lead up to the action
2. Behavior—the response to previous events
3. Consequences—the results of the conduct.

In general, antecedents influence workers' behavior, which results in certain consequences. Furthermore, there are “four types of consequences that strengthen, maintain, or weaken behavior [...] known as contingencies of reinforcement:” positive reinforcement, negative reinforcement, punishment, and extinction (McShane & Von Glinow, 2007, p. 55; SHRM, 2007b). Positive reinforcement rewards individual behavior in order to encourage continued performance that warrants further recognition (SHRM, 2007b). Negative reinforcement removes punishment in an attempt to reinforce behavior that does not warrant punishment (SHRM, 2007b). Punishment attempts to prevent negative behavior by imposing restrictions or intervention that eliminates specific activities (SHRM, 2007b). Lastly, extinction is simply ignoring behavior until it ceases to exist (McShane & Von Glinow, 2007; SHRM, 2007b).

Positive reinforcement, the preferred method of employers to encourage effort that achieves organizational goals, is categorized as either a contrived or natural motivator (SHRM, 2007b). Contrived reinforcement includes extrinsic rewards, such as salary increases and bonuses. Natural motivators are intrinsic motivators and address Maslow's need for esteem. Natural motivators exist in the form of attention, recognition, praise, and positive performance feedback. This type of motivation costs the organization very little, but it positively impacts individual and organizational performance (SHRM, 2007b).

Organizational supervision is critical to the timely and effective employment of appropriate reinforcement techniques. SWOs are subjected to various positive and punitive measures to motivate individual behavior via the chain of command supervisory structure, the military legal process, and the Navy's awards system. However, unlike civilian organizations, the Navy currently has limited opportunity to positively reinforce behavior with contrived reinforcement methods. In the SWO community, direct financial compensation, such as a performance bonus, does not exist. Though personal awards may be authorized, top performers are often rewarded by receiving yet more responsibility and further opportunity for promotion.

3. Agency Theory

Jensen and Meckling (1976) developed agency theory or the principal-agent model to explain the interactions between divergent interests of firms (i.e., principals) and the firms' managers or employees (i.e., agents). The Agency Theory rests on the premise that agents are "motivated by self-interest, are rational actors, and are risk-averse," while it is the principal's responsibility to motivate agents on their behalf (Stroh, Brett, Baumann, & Reilly, 1996, p. 751). Managers are driven to maximize salary while minimizing effort. They are motivated by opportunities that further their own cause, such as promotions, salary, and other self-serving interests, that may directly contradict organizational goals. "[A]gency theory is predicated on the assumption that people prefer to avoid both work and risk" (Bloom & Milkovich, 1998, p. 283). Conversely, the firm's goals are to align the managers' goals with those of the firm at the lowest possible cost to the firm, in an attempt to maximize overall profits. This balance requires firms to manage and motivate the actions of its agents and to optimize agent compensation consistent with profit and performance maximization. Stroh et al. (1996) explained that a dilemma is created when the agent's task is less structured (i.e., less job programming), when the task entails risk, or when the goals between the principal and agent differ.

An effective and efficient firm monitoring system, coupled with appropriate compensation for employees, is necessary when conflicting interests exist between principals and agents. An inherent problem associated with agency theory is that "the

agent's rational self-interest and effort aversion create the potential for moral hazard—the agent may act to maximize his or her outcomes (e.g., compensation) without extending effort toward achieving the principal's objectives” (Bloom & Milkovich, 1998, p. 284). The less an agent is monitored by the principal, the greater the risk associated with the potential moral hazard (Bloom & Milkovich, 1998). Therefore, monitoring and agent accountability are incorporated into the employer-employee (i.e., principal-agent) relationship. Additionally, firms use two types of compensation packages to align the efforts of individual agents with the efforts of the organization. Firms use either variable pay (e.g., bonuses, incentives, profit sharing, and stock options) or fixed pay (e.g., annual salary) (Ekanayake, 2004). Depending on the type of job and the particular job market, risk is associated with variable pay. Variable pay is dependent on individual and group outcome, whereas fixed pay offers greater consistency over time. Compensation is further determined by behavior-based (as determined by level of effort) or outcome-based (i.e., incentive-based) pay systems (Bloom & Milkovich, 1998). While performance is a component of both compensation schemes, a predominantly structured incentive-based pay system creates greater pay variability as pay is more closely tied to outcome and is usually captured by performance metrics. As a result, “[o]ptimal compensation contracts must, therefore, reflect the trade-offs inherent in this balance by using enough incentive pay to align the agent's interests with those of the principal without shifting too much risk and compensation variability onto the agent” (Bloom & Milkovich, 1998, p. 284).

Studies on civilian organizations show that using greater incentive pay has the effect of aligning the behavior of agents with organizational goals, thereby increasing shareholder return, growth in sales, and overall performance (Bloom & Milkovich, 1998). It may be immature to presume in the SWO community that incentive pay via performance-based compensation would directly improve readiness, training proficiency, or tax payer savings, but “incentive pay can be useful for aligning the actions of agents with desired organizational outcomes” (Bloom & Milkovich, 1998, p. 284). It is hypothesized that this interaction is consistent across all sectors in the labor market.

Application of the agency theory model to the military environment differs little from its application in the civilian sector. However, the Navy, unlike most civilian firms,

does not act on behalf of shareholders or owners. The military (principal) has a clearly defined objective to meet national security needs in the most cost-effective means possible as promulgated by the President's national security policy and the annual Defense Authorization and Appropriation Bills. Meanwhile, despite intrinsic rewards inherent in military service, Surface Warfare Officers (agents) seek to maximize their compensation by preferring to get paid more for less effort.

Surface Warfare Officers are monitored by the chain of command, and performance is recorded by the Navy's fitness reporting (FITREP) system—a key component of the current fixed pay system. However, monitoring in the Navy does not necessarily fit the constructs of monitoring in the civilian sector. Not all aspects of officer behavior can be closely observed via “formal information systems, such as budgeting and management reporting, and informal information sources such as managerial observation and surveillance” (Ekanayake, 2004). Most SWOs, particularly Ensigns (O-1) through Lieutenants (O-3), have some form of direct supervision. However, some activities often require mid-grade and senior officers to serve as senior, unit representatives for long periods of time with very little oversight. Workers under less rigid monitoring systems are efficiently motivated through incentive-based compensation measures. SWOs who contest the goals of the Navy are not promoted and eventually leave at the completion of their service obligation. Those who retain continue to receive a uniformly fixed salary, which is consistent across all services based on time in service and rank. Additionally, SWOs receive special and incentive pays that are not directly tied to performance.

4. Herzberg's Motivation-Hygiene Theory

In describing the Motivation-Hygiene Theory, Herzberg (1987) dispelled the belief of two diametrically opposed concepts of understanding human behavior: satisfaction and dissatisfaction. Applying Maslow's Needs Hierarchy Theory, Herzberg focused on two specific needs: the need to achieve, which develops into psychological growth (i.e., esteem leading to self-actualization); and the need to avoid pain while acquiring other basic biological needs (i.e., safety and physiological). The need to

achieve consists of intrinsic factors: achievement, recognition, motivation derived from work, responsibility, and growth or advancement in the organization. Herzberg (1987) referred to intrinsic needs as growth or motivator factors. Meanwhile, hygiene factors are extrinsic to the job. Known as “KITA [...] kick in the ass” factors, they encompass aspects of the job such as coworker relations, company policy, supervision, salary, working conditions, status, and job security (Herzberg, 1987, p. 109). Various studies show that improving the quality of hygiene factors leads to job satisfaction, while unacceptable hygiene factors lead to employee dissatisfaction. Though extrinsic or hygiene factors, including work-related components like job security and salary, are not the primary factors motivating employees, hygiene factors must be sufficient for intrinsic factors to effectively motivate. Thus, intrinsic or motivational factors have been found to be the primary cause of employee satisfaction. (SHRM, 2007b; Herzberg, 1987)

The military is no stranger to applications of Herzberg’s Motivation-Hygiene Theory. The 2000 Military Exit Survey indicated that 30 percent of the respondents were dissatisfied with the quality of leadership (DMDC, 2001). Loyalty, patriotism, benefits, job security, and educational benefits were cited as the most influential factors affecting retention past the initial service obligation in the 2004 SWO Continuation Intentions Quick Poll (NPRST, 2004). Furthermore, in the 2005 SWO Junior Officer Survey, leading and training subordinates, relationships with peers in the wardroom, leadership challenges using skills and abilities, mental challenges using skills and abilities, and relationships with senior enlisted personnel were cited as key components to junior officer satisfaction in the SWO community (Department of the Navy, n.d.). All of these examples support the positive impact of intrinsic motivators and extrinsic hygiene factors throughout SWOs’ careers and ultimately in their career intentions. These data do not discount the value of adequate compensation; however, they indicate that job satisfaction encompasses a mixture of factors that must be present to motivate employees to perform.

5. Management Philosophy Theories

In 1960, McGregor introduced two opposing management perspectives that describe employee behavior and the thought process that drives such behavior in his

book, *The Human Side of Enterprise* (as cited in Pierce, 1991). Theory X and Theory Y represent assumptions on personnel philosophies and explain how employees approach leadership. As leaders in the workplace, managers must be knowledgeable of employees' knowledge, skills, and abilities in order to achieve organizational goals (Pierce, 1991; Carson, 2005). Both theories are predicated on the concept that management is responsible for adhering to the firm's guiding principles and "organizing the elements of productive enterprise—money materials, equipment, people—in the interest of economic ends" (Pierce, 1991, p. 9).

a. *Theory X and Theory Y*

The principles of Theory X perceive employee behavior negatively, as employees must be directed, motivated, and controlled to meet organizational goals. According to Theory X, employees are essentially lazy; they prefer to work as little as possible. Workers lack discipline, prefer not to have responsibility, need to be led, dislike change, appear apathetic to organizational needs, and are not intelligent. Theory X workers must have close supervision, and they require thorough oversight and external motivation to accomplish their tasks. (Pierce, 1991; Carson, 2005)

By comparison, Theory Y workers are proactive as well as responsive to organizational needs (Carson, 2005). Applying principles of motivation, Theory Y workers learn from the organization and apply efforts accordingly. Their behavior is goal-oriented and tends to be more intrinsically motivated (Pierce, 1991). In describing the Theory Y worker, Pierce (1991) stated:

The motivation, the potential for development, and the readiness to direct behavior toward organizational goals are all present in people. Management does not put them there. It is a responsibility of management to make it possible for people to recognize and develop these human characteristics for themselves. (p. 10)

Working with Theory Y employees, management must coordinate the efforts of motivated employees so they can reach their full potential while meeting organizational

objectives. Managing Theory Y personnel involves creating opportunities for employees to flourish, coupled with less direct supervision from leadership. (Pierce, 1991; Carson, 2005)

Discussed in the subsequent sections, additional management philosophies include Theory Z, the Peter Principle, and Theory A. Though unrelated to one another, these concepts complete the cycle of management approaches applied in modern industry and provide ample room to develop new management approaches.

b. Theory Z

Theory Z, prevalent in Japan, is structured around “very intense competition to qualify for the better schools and thereby be assured of career employment in a major firm or organization” (Pierce, 1991, p. 10). Japanese firms offer employees the opportunity to earn lifetime employment—a concept foreign to US organizations in which the typical worker may only hold a job for approximately eight years, and only 25 percent of the workforce hold jobs that last 20 years or longer (Hall, 1982). Through firm placement assisted by the Imperial University and select private schools, Japanese graduates are matched with employers in lieu of the traditional application and hiring practices common in the United States. Employees hired into major firms are assured life-long jobs and an accompanying retirement package. Typically, promotions within major firms do not occur until 10 years of tenure, while longevity within the firm is capped by a mandatory retirement age of 55. For employees reaching this age, Theory Z employment practices allows for placement in satellite companies to extend their careers. This structure creates extreme competition within the school system and is responsible for developing high-quality employees with unprecedented firm loyalty. (Pierce, 1991)

c. Peter Principle

Within the Navy, promotion to Lieutenant Commander (O-4) and to more senior levels is based primarily on two factors: performance and the number of vacancies at higher levels. The Peter Principle contends that “individuals are promoted to their level of incompetence” (Pierce, 1991, p. 11). Two management issues surface because of

such promotion practices. First, many employees may not enjoy the same success in a higher hierarchical level if they are promoted out of a lower position in which they did well, were comfortable with, and contributed at their maximum performance level. Either these employees were ill-equipped to assume the higher-level position and surpassed their skill level or they simply did not like the new position. Once promoted, they become despondent and unsuccessful. Second, as upper hierarchical levels are filled by unqualified employees, promotion opportunities for more qualified and motivated employees are hampered. This results in higher job turnover as these highly qualified employees seek job opportunities elsewhere (Pierce, 1991).

d. Theory A

Theory A recognizes that not all employees are capable of being groomed for command or upper-level management positions. Employees have varying potential, personal goals, and career aspirations. Theory A borrows concepts from Theory Y (regarding attitude and commitment) and Theory Z (which values human capital throughout the employee lifecycle) to explain how to deal with valuable employees who may not achieve the higher expectations resulting from promotion. Theory A provides an “honorable demotion” for employees who get promoted beyond their expertise and productivity (Pierce, 1991, p. 11). US management does not consistently practice demoting employees back to a level in which they achieved the most success, thereby limiting organizational movement to an up-or-out system, similar to the Navy’s promotion system. Employees are promoted, retired, or terminated from the firm, resulting in lost valuable human capital at the vacated position. If employees do not perform well at the next higher level, as explained by the Peter Principle, they do not suddenly become less effective at that original position. If terminated, former employees take their accumulated general human capital to other firms. This practice maintains valuable firm-specific human capital and continues to take advantage of the motivation and goal orientation described in Theory Y. (Pierce, 1991)

Not all management philosophies directly apply to the Navy. Some leaders may follow Theory X, while others have more confidence in their subordinates

and lead via Theory Y. Inherent to the SWO promotion process, the Peter Principle offers an interesting perspective on why some officers do not continue to receive promotions. Regardless of the management philosophies to which junior officers have been exposed during their careers, the leadership and management style of their supervisors affects their performance, qualifications, and productivity, as well as influences future retention decisions.

6. Expectancy Theory

Vroom introduced the concept of Expectancy Theory in his 1964 book titled *Work and Motivation* (as cited in Isaac, Zerbe, & Pitt, 2001). Further research developed expectancy theory, which suggests “that the expenditure of an individual’s effort will be determined by expectations that an outcome may be attained and the degree of values placed on an outcome in the person’s mind” (Isaac et al., 2001, p. 214). Based on expectancy theory, leaders have the opportunity to motivate subordinates by allowing them to meet self-serving interests that also directly support organizational goals. The greater the alignment of these two goals, the more success both the worker and the organization may experience. Depicted in Figure 27, the Expectancy Theory of Motivation has three levels:

1. E-to-P expectancy: individual effort will lead to a certain level of performance
2. P-to-O expectancy: individual action or performance will lead to outcomes
3. Outcome valences: outcomes will yield one or more levels of satisfaction or dissatisfaction. (Isaac et al., 2001; McShane & Von Glinow, 2007; SHRM, 2007b)

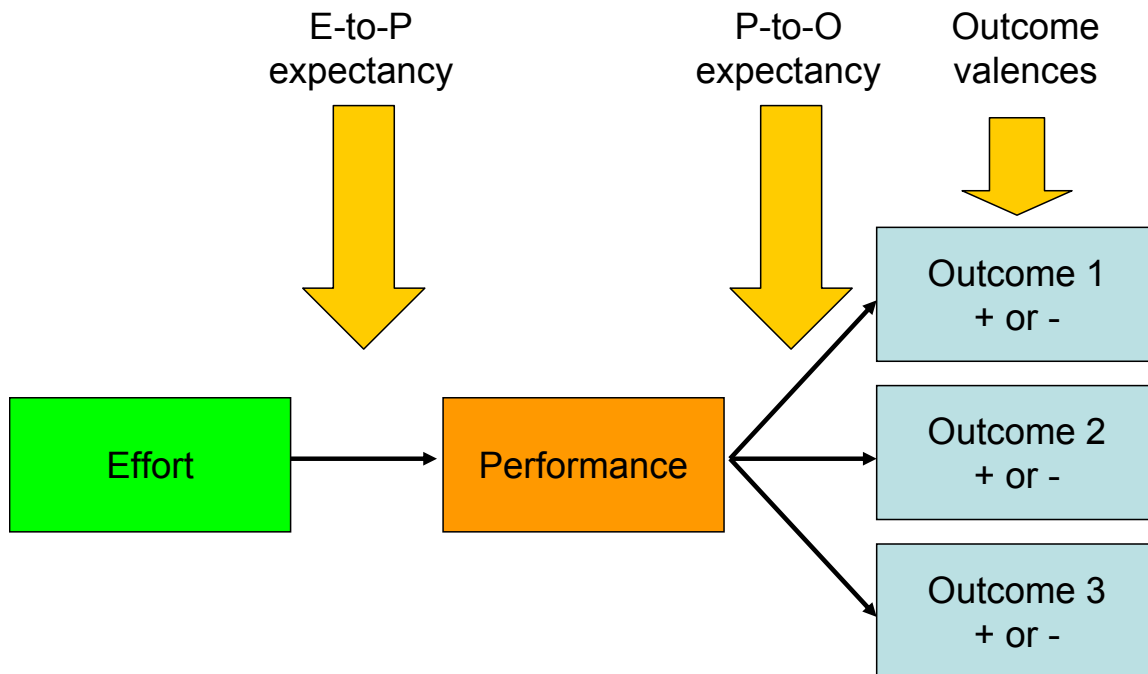


Figure 27. Expectancy Theory of Motivation
(Adapted from McShane & Von Glinow, 2007, p. 96)

Direct leadership applications are applied at each level of the expectancy theory model to increase employee motivation. As shown in Figure 27, employee motivation can be influenced at each level by adjusting the input. Thus, managers can increase employee confidence at the effort-to-performance (E-to-P) level, by reinforcing the capacity of reaching a desired level of performance through hard work and cognitive ability. This system develops a positive environment that fosters employee and organizational growth. Performance-to-outcome (P-to-O) expectancy matches higher performance with greater rewards. Greater rewards encourage greater performance from individuals. Lastly, outcome valences are based on individual attitudes and values; therefore, outcome valences are not universally interchangeable motivational tools. Rewards should be tailored to meet individual needs rather than the division or department as a whole. (Isaac et al., 2001; McShane & Von Glinow, 2007; SHRM, 2007b)

Isaac et al. (2001) described expectancy theory as “a process of motivation [that] emphasizes individual perceptions of the environment and subsequent interactions arising

as a consequence of personal expectations [... which] mainly relies upon extrinsic motivators to explain causes for behaviours [sic] exhibited in the workplace” (p. 214). Leaders with the opportunity to manage intrinsic motivation with extrinsic rewards are in a position to significantly influence behavior in the workplace. Conversely, weaknesses in the relationship between the levels of expectancies severely alter employee motivation. Figure 28 provides a detailed list of managerial issues regarding the successful implementation of expectancy theory motivation (Isaac et al., 2001).

The Effort/Performance Linkage (E-P)	<ol style="list-style-type: none"> 1. Is the nature of the work assigned reasonable, interesting, attainable and challenging? How does the follower feel? 2. Does the follower feel able to perform the task? Is more education, training and/or experience warranted? 3. Does the follower possess the self-confidence required to do the job? Do I need to spend more time with this individual to raise the level of confidence? 4. What constitutes acceptable performance for the follower and are we both sure we know this and agree? Do we have concrete measures of performance to monitor? 5. Does this job provide the follower with feelings of usefulness, involvement and competence? What can I do to reinforce these emotions?
The Performance/Outcome Linkage (P-O)	<ol style="list-style-type: none"> 1. Do my employees trust me? Do I keep promises made to my followers? Do I avoid making excuses and lies? 2. Am I predictable, as well as fair, in dispensing outcomes to all of my followers? While outcomes may vary in each case, are they perceived as being equitable? Am I consistent in their application?
The Valence	<ol style="list-style-type: none"> 1. Are the goals of the follower congruent with those of the organization? Does the follower perceive this? What can I do to engineer a greater degree of alignment in these regards? 2. Is the outcome for the follower worth the expenditure of time and effort? What constraints on and off the job influence this person? Do we have realistic and mutual expectations and are they current? 3. Am I offering this follower rewards he or she really values? What informal rewards can I offer over and above the formal ones sanctioned by the organization? How are they perceived?

Figure 28. Issues for Managers to Address Using Expectancy Theory on Followers (Isaac et al., 2001, p. 221)

In the SWO community, there are limited opportunities to apply Expectancy Theory to influence individual officer's performance. The Navy awards program is one popular method to distinguish individual achievement and to motivate behavior. Additionally, the Navy's FITREP program is another way to recognize superior performance. However, neither program is relatively timely for acknowledging individual accomplishments. Furthermore, neither program serves as well as the extrinsic motivators (i.e., performance bonuses or instantaneous job promotions) employed in the civilian sector.

7. Equity Theory

Regardless of employer, equity theory is based on the principal that all workers desire equal treatment. Furthermore, equity theory describes how perceptions of fairness are developed as employees make comparisons with fellow coworkers. Awareness of inequity occurs when the ratio of an individual's input-to-outcome varies relative to the ratios of other employees, holding the quality of inputs constant. Outcomes are contingent upon extrinsic rewards such as pay and benefits, but may also contain intrinsic rewards such as recognition. Inputs are comprised of education, work experience, skills, qualifications, effort, and performance. Three conditions of Equity Theory represent the different levels of input-to-outcome ratios: under-reward inequity, equity, and over-reward inequity. As expected, under-reward inequity occurs when employees are not being rewarded equally. Equity is present when employees receive relatively equal outcomes for equal input. Over-reward equity occurs when individuals receive greater outcomes from the same level of input as other workers. (McShane & Von Glinow, 2007; SHRM, 2007b)

McShane and Von Glinow (2007) offered various options for reducing the level of inequity among coworkers:

- Reduce inputs—reduce your own effort
- Increase outcomes—ask for a pay raise or take advantage of company benefits (either authorized or unauthorized)
- Increase comparison (individual or group) inputs—increase the workload or level of performance of the comparison coworker

- Reduce comparison (individual or group) outcomes—decrease the rewards to the comparison coworker
- Change perceptions about input-to-outcome ratios—convince yourself an equitable situation exists
- Change the comparison unit—establish a new comparison coworker
- Leave the environment—spend more time away from the workplace or quit.

Employers also have options to improve the perception of fairness: an open dialogue about the perceived inequality, an unbiased and consistent distribution of outcomes, and respectful treatment of all employees (McShane & Von Glinow, 2007).

The greatest competitive comparison made between coworkers involves either relative position or salary (Lazear, 1989). Labor unions and management may desire uniform salary in an attempt to create a more harmonious workplace; however, “the morale of high-quality workers is likely to be adversely affected by pay that regresses toward the mean” (Lazear, 1989, pp. 561-562). According to Lazear (1989), competition is good for individual as well as organizational productivity. An employer who recognizes hard work through a monetary outcome signals that hard work yields positive financial rewards, which can often be a powerful motivator. However, in a competitive environment, sabotage may occur, which negatively influences employee cooperation and results in decreased productivity or efficiency. In his study of pay equality, Lazear (1989) determined that profit-maximizing firms utilize a more equitable wage structure, thereby minimizing less productive behavior. However, paying workers based on their relative performance remains a successful motivational management tool. Lazear (1989) contends that the desired outcome, reduced workplace competition, and increased productivity nurtured by a cooperative environment determine the level of pay compression toward a uniform pay structure.

Within the Navy, pay compression exists in each pay grade. All Surface Warfare Officers within the same grade receive regular uniform military compensation comprised predominantly of basic pay and other basic allowances. The only pay variation occurs in special and incentive pays or allowances that consider service location, deployment status, and specialty skills (e.g., nuclear training, language proficiency, etc.). The

competitive structure or tournament theory of promotion provides the only true opportunity to observe applications of equity theory. It appears that similar service records may be reviewed by the promotion board (comprised of senior-ranking officers), and some SWOs may receive the promotion while other eligible SWOs may not. Knowledge of the promotion of lower-quality officers creates a severe motivational dilemma among non-selected officers. Even though a flat pay scale seemingly eliminates pay inequity, outcome rewards in the form of job recognition and promotion (ultimately creating higher pay) create an under-reward inequity situation for some SWOs. This situation may become more prevalent at more senior-level promotion boards. Often, career retention decisions have already been made at these higher hierarchical levels. However, under-reward inequity influences the decision to retain in the Navy beyond 20 years of service.

D. CHAPTER SUMMARY

The Navy's internal labor market with limited lateral entry opportunities exacerbates the complexity and impact of recruiting, promoting, and retaining quality Surface Warfare Officers. Manning shortfalls in mid-grade and senior-level ranks highlight this concern and create severe spillover effects that affect SWOs near major career decision points or ports of exit. Officer retention decisions are influenced by labor economic theories, such as general and firm-specific human capital, efficiency wages, the military's promotion tournament system, the relationship between performance and turnover, and the correlation between performance and pay. Additionally, organizational behavior theories offer explanations for individual SWO motivation, including how compensation motivates performance, which increases the probability of retention. These economic and organizational behavior theories provide the foundation for analysis of retention behavior in the SWO community and the future application of performance-based compensation in the Navy.

How much longer can the Surface Warfare Officer community continue to operate doing more with less? As the Global War on Terrorism surpasses its fifth year at the time of this writing, the strain on the Navy is severe. Continued support of

requirements outside of traditional SWO community billets, whether through individual augmentation (IA) assignments or Global War on Terrorism Support Assignments (GSA), reduces manning levels in critical billets. The SWO community manpower is spread thin. Based on studies that reveal high performance has a positive effect on retention, compensation systems that recognize higher-performing employees may be effective in addressing retention issues. By paying high-performing employees even more (i.e., efficiency wages), senior leaders may increase SWOs' probability of retention.

Labor economic theory and organizational behavior concepts outline the analysis of SWO pay and performance data. This is the first step in assessing the current SWO retention bonus system for possible reform, as quantitative data support the challenges facing manpower planners regarding the costs and benefits associated with retaining a qualified and talented officer workforce. These economic and organizational behavior theories frame the forthcoming analysis of Surface Warfare Officer pay and performance data.

V. PERFORMANCE-BASED COMPENSATION IN PRACTICE

A. OVERVIEW

To succeed in an environment in which declining budgets are juxtaposed against aggressive growth targets, organizations must obtain the highest possible level of performance from their workforces. Already an ambitious goal, this task is made particularly challenging by the overwhelming number of viable approaches to performance management and the lack of consensus and understanding as to which strategies effectively drive performance. (CLC, 2002, p. 2a)

To develop a better understanding of performance-based compensation in today's workplace and its implementation in the surface warfare community, it is critical to review how organizations implement pay for performance in their business practices. This chapter discusses performance-based compensation applications in the labor market. The first section covers implementation of pay for performance and commonly used performance-based compensation methods. The second section analyzes government-directed, performance-based compensation demonstration projects at select federal agencies. The third section analyzes a return to skills comparison study between the General Schedule (GS), Performance Management Recognition System (PMRS), and China Lake compensation systems. The fourth section reviews two successors to the demonstration projects: the Department of Homeland Security (DHS) and the National Security Personnel System (NSPS) performance-based compensation systems. The fifth section reviews performance-based compensation in the civilian sector. The final section analyzes problems encountered during performance-based compensation implementation.

B. IMPLEMENTING PERFORMANCE-BASED COMPENSATION

The US Office of Personnel Management (OPM) presents a compelling argument as to why the federal pay system must change its compensation strategy in its 2002 White Paper, *A Fresh Start for Federal Pay: The Case for Modernization*. The OPM contends that in order “to recruit, manage, and retain the human capital” needed to meet today's

challenges and those of the future, the government must change its pay structure (OPM, 2002, p. v). The OPM's White Paper (2002) discusses transforming the current pay structure into one that is: more performance-oriented, focused on compensation measures more closely linked to individual performance, aligned with organizational goals, and tied to more competitive salaries. Major contentions the OPM (2002) cited regarding the federal GS pay system included the following:

- It is market-insensitive, reflecting only level of work and locality.
- It is performance-insensitive, as pay raises are primarily linked to time in grade.
- It is dependent on internal equity, and does not utilize external labor market rates or the value an individual contributes to the organization.

So how do organizations transform their pay systems into a performance-based structure? When adopting performance-based compensation, organizations must consider employee performance and existing compensation theories, such as human capital theory, efficiency wage theory, and tournament theory, among others. Additionally, the US Merit Systems Protection Board (MSPB) (2006) contended that “[1] the coverage of a pay for performance system, [2] the types of performance to be rewarded, [3] how performance will be measured, [4] the form that pay for performance will take, and [5] the delegation and review of pay decisions” must be carefully analyzed in making compensation changes (p. xi). According to Turner (2006), organizations implement performance-based compensation primarily in an attempt to satisfy two goals:

1. To motivate employees to increase their effort (i.e., performance)
2. To better align employee efforts with organizational goals.

However, organizations must also realize there are unintended consequences and secondary spillover effects of a compensation program on its employees. Not every impact will be positive.

The Corporate Leadership Council (2002) states that performance can be positively influenced by either providing employees the know-how, experience, or resources to improve their performance or by influencing employee attitudes that drive

performance. Implementation of a performance-based compensation system as the tool that drives performance requires that employees:

1. Value pay in recognition for their performance
2. Understand performance-oriented job expectations
3. Believe that they can achieve the desired level of performance
4. Have confidence that they will be justly recognized and compensated for their effort (MSPB, 2006).

Motivational behavior theory suggests limitations on the impact that extrinsic rewards have on changing workers' habits and motivation. MSPB (2006) identifies seven critical components of a successful performance-based compensation system:

- A culture that supports pay for performance
- Effective and fair supervision
- A rigorous performance evaluation system
- Adequate funding
- A system of checks and balances to ensure fairness
- Appropriate training for supervisors and employees
- An ongoing system of evaluation (p. xii).

However, organizations may be successful in implementing performance-based compensation while not satisfying each of these components. Similarly, other organizations may satisfy and implement each of the seven components, yet are unsuccessful in their performance-based compensation program because of their business design or industry structure. For example, it may be incongruous to apply performance-based compensation to jobs in which the primary focus is “quality, safety, or teamwork” (MSPB, 2006, p. xi). Therefore, an organization should evaluate its objectives, measurement criteria, and incentive structure before implementing a performance-based compensation system.

So how and why do organizations choose performance-based compensation? Pay for performance links financial rewards such as pay raises, bonuses, or other monetary compensation directly to individual or organizational productivity (MSPB, 2006; Risher, 2004). Employee effort is associated with expected financial compensation and, as a performance-based component of pay, provides an incentive to increase performance. Increased employee productivity and work effort are subsequently rewarded with higher pay. In performance-based compensation systems:

- Top performers receive the largest compensation and are motivated to continue their high level of performance.
- Average performers receive relatively modest pay raises and are provided an incentive to work harder to achieve higher raises.
- Poor performers receive no pay raises (and sometimes pay cuts) and are encouraged to improve their performance or, through functional turnover, influenced to leave the organization (MSPB, 2006).

Conversely, both Strickler (2006) and Rabin (2006) argue that human motivation in the workplace is not driven solely by financial compensation. Employee performance is comprised of both self-interested motives and social preferences. Pride, sense of duty, and satisfaction are but a few of the intrinsic values that influence employee behavior and are tied to on-the-job performance.

The decision to implement performance-based compensation and “the effectiveness of pay for performance in facilitating recruitment, retention, and motivation (and the resulting improvements in individual and organizational performance) depend heavily on matching the approach to the situation” (MSPB, 2006, p. 3). Ultimately, organizations strive to encourage top employee performance at a cost which allows them retain top talent while maximizing overall profits. This concept applies equally to organizations that use public funds to achieve organizational goals within a constrained budget. However, private organizations keep a more watchful eye on “the overwhelming importance of the so-called bottom-line—the need to maintain adequate levels of profitability” (Risher, 2004, p. 26). By shifting from a tenure-based to a performance-based compensation system, the SWO community can take advantage of these benefits, if the pay scale is structured properly and incorporated so that it matches existing

organizational culture. Figure 29 depicts the process of an evolving organizational culture toward a performance-oriented workplace.

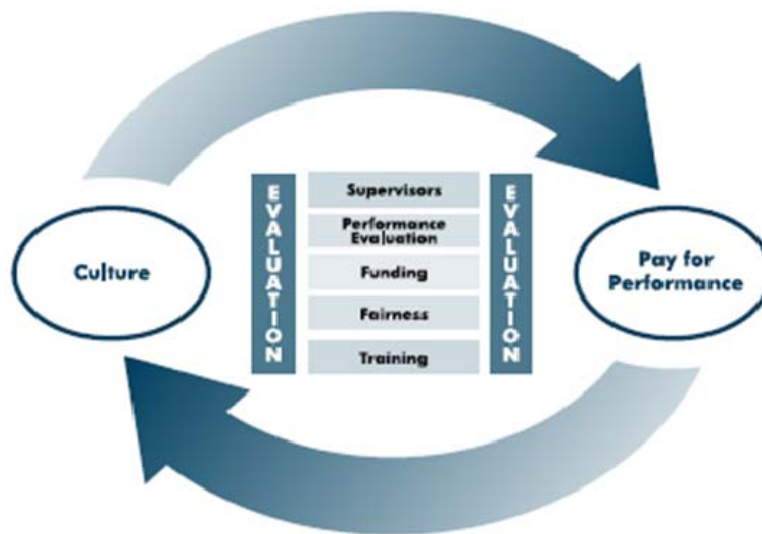


Figure 29. Changing Organizational Culture with Pay for Performance
(MSPB, 2006, p. 4)

In evaluating an organization's compensation structure in accordance with Figure 29, change agents must determine whether the organization is ready to undergo such a transformation. Decisions influencing compensation reform must include:

- A specific timeline for program implementation
- A determination of which employees will be affected by the compensation change
- A comprehensive performance evaluation system,
- A decision on how compensation will be awarded and where the funding will come from
- A program monitoring system so that it achieves the intended effects
- A continuous training program to ensure success.

These steps require time, and they involve employee participation and buy-in at all affected levels of the organization. (MSPB, 2006; Risher, 2004)

Successful performance-based compensation implementation requires organizations to invest in a substantial amount of research, planning, communication and

training (MSPB, 2006; Risher, 2004). Furthermore, a performance-based compensation system is a program that requires continuous attention. As stated by MSPB (2006):

Organizational goals will change; performance goals and measures will become obsolete; performance may improve or decline; managers may make errors in evaluating performance or allocating rewards. For all of these reasons and more, agencies need to monitor the operation and effectiveness of their pay for performance systems and modify them accordingly. Only by giving the pay systems and related organizational requirements the ongoing attention that they warrant will agencies be able to obtain optimal results from their pay for performance systems. (p. xiv)

Performance-based compensation structure is complicated by the fact that most organizations do not have a sufficient wage differential among their employees. Many firms use pay systems that are independent of performance, such as:

egalitarian pay systems apparently motivated by horizontal equity considerations, the asymmetric effects of rewards and punishments, tenure and up-or-out promotion systems, survey-based and seniority-based systems, profit sharing [...] and the general reluctance of employers to fire, penalize, or give poor performance evaluations to employees. (Baker, Jensen, & Murphy, 1988, p. 594)

In circumstances in which high-performing employees operate at twice the level of production as lower-performing employees, rarely do their wages reflect twice the increased productivity or value to the company (Medoff & Abraham, 1980; Baker et al., 1988; Hudson, 2005). Organizations in which there is minimal pay differentiation create a disincentive for either the high performer to provide extra effort or the low-performing employee to change less-than-productive habits.

A primary difference between performance-based compensation and other pay systems is that performance-based compensation systems are characterized by “annual salary increases [that] are based on an appraisal of an employee and, more specifically, on the appraisal rating” (Risher, 2004, p. 20). In this manner, companies utilizing performance-based compensation use evaluations to measure how well “in the year of evaluation, [a worker] is carrying out the responsibilities of his or her job. Thus, a

performance rating should reflect an employee's current level of performance relative to the level of performance deemed normal for someone in his or her position" (Medoff & Abraham, 1980, p. 708).

In implementing performance-based compensation, Risher (2006) claims that three pay structures represent employer compensation options:

1. Pay for performance, which measures previous years' performance.
2. Pay for competence, which measures how employees develop their job skills to achieve organizational goals.
3. Pay for contribution, which involves a combination of performance and competency.

Furthermore, once an organization has decided to implement a performance-based compensation policy, leadership must decide not only what performance metric to use, but also how to distribute financial rewards. Two commonly used practices are annual salary increases and bonuses. Additionally, some organizations use internal equity and stock options to recognize and financially motivate their employees, though these options are unfeasible for Navy compensation applications since the US military is not a publicly traded organization.

1. Annual Salary Increases

Many organizations set annual salary increases to keep pace with established market pay levels, in which annual pay increases represent a percentage of the organization's total combined salaries. Therefore, if market salaries experience a 4-percent annual increase, an organization may increase their salary budget by 4 percent to match market conditions. However, in a performance-based system, not all employees receive the market standard 4-percent annual raise. Tied to employee evaluations, an employee's performance rating dictates the percentage of salary increase. Companies utilizing such a system and allocating a 4-percent total salary budget increase, for example, will allocate different percentage increases based upon employee ratings. Performers who exceed expectations (i.e., top performers) earn a larger percentage increase—a 5- to 10-percent range. Average performers might receive the 4-percent market increase. And, lower performers will likely receive less than the 4-percent market

increase. In this scenario, since the organization's salary budget is fixed, there exists a "zero-sum game problem [...] since each plus has to be offset with a minus" (Risher, 2004. p. 22). Thus, the total amount of pay increase of the top performers is matched by the salary decrease of the lower performers.

Other deviations may occur to annual salary increases based on market conditions and pay strategies. In situations in which an organization's salary level is below the market level, and the organization can afford to adjust its salary by a higher rate to better match the market salary level, then top and average performers may see a significantly higher-than-market-level increase. The reverse situation may also occur if organizations cannot afford to match market level increases. In such cases, even the top performers are subject to a less-than-market-level annual salary increase, but still a larger salary increase relative to the lower-performing employees within the organization.

2. Performance Bonuses

Some firms compensate performance by utilizing a bonus structure. Bonuses are financial rewards allocated to employees based on individual or group effort or productivity for actions that have been completed during a previous evaluation period. According to Risher (2004), recognized bonus structures include:

1. Spot awards to recognize individual effort on particular actions or contributions.
2. Year-end bonuses representing annual achievement.
3. Technical achievement awards for developing specific technical ideas.
4. Key contributor awards used to recognize and retain particularly valuable employees.
5. Gain-sharing bonuses as a group incentive that are awarded and aligned with worker productivity.
6. Goal-sharing awards that recognize organizational or group goals.

The first four bonuses represent compensation for individual effort, while the remaining two bonuses are awarded for group activity.

Furthermore, annual salary increases are often absorbed into organizational policy as entitlements. Employees will no longer differentiate salary raises in terms of

productivity or compensation for their effort and will come to expect their annual salary adjustment regardless of their contribution to the organization. By comparison, bonuses more clearly represent compensation for a quantifiable effort. (Risher, 2004)

Compensation research identifies a clear distinction between financial rewards used as incentives and those categorized as bonuses. Bonuses recognize performance based upon “after-the-fact decisions” (Risher, 2004, p. 25). Incentives are based on goals set at the beginning of the evaluation period that are used to motivate employees to meet the particular performance targets. Currently, the Navy’s retention bonus program for Surface Warfare Officers does not include a performance-based component. SWOs are financially rewarded for accepting an additional obligation of commitment, such as the completion of two department head tours for the Junior SWO CSRB and the SWOCP bonus programs (Chief of Naval Operations, 2006).

3. Miscellaneous Rewards

Profit sharing or the award of stock options based on a company's profitability, commissions-based awards (more common with sales personnel), and per-job compensation (which is more common in manufacturing) are other forms of compensation not used as commonly as annual salary increases and bonus compensation mechanisms. All of these pay schemes, however, are similar in their purpose. They identify and attempt to adequately compensate employee performance by awarding higher levels of performance with increased compensation. Unfortunately, internal equity compensation plans are not practical in the public sector and, therefore, are unrealistic options for the SWO community.

C. GOVERNMENT DEMONSTRATION PROJECTS

Recruitment and retention of highly skilled employees in the federal government are increasing concerns that emerged in the 1980s. Between the 1980s and 1990s, the wages earned by highly skilled federal employees fell substantially behind those wages earned in the private sector (Gibbs, 2006).

Private-sector labor-market returns to various measures of skills increased dramatically. For example, the college wage premium and the returns to experience both increased [...] These trends were widespread in the private sector. They have been observed within and between occupations, firms, establishment, and industries; within demographic groups; and within managerial ranks. (Gibbs, 2006, p. 199)

In response to growing concerns in the public sector regarding recruitment and retention of highly skilled federal employees, the widening wage differential compared to the private sector, and the *Civil Service Reform Act (CSRA) of 1978*, Congress authorized personnel demonstration projects to study pay reform and performance management systems in government organizations. Under the direction of the Office of Personnel Management (OPM), 17 demonstration projects were approved with the common focus “that the federal government needs to fundamentally rethink its current approach to pay and better link pay to individual and organizational performance” (GAO, 2004, p. 2). While 12 of the 17 demonstration projections resulted in implementation of performance-based compensation programs, the GAO (2004) report discusses only six. These demonstration projects covered 27 locations, spanned both US coasts, and included over 39,000 federal employees:

- The Navy Demonstration Project at China Lake (China Lake)
- The National Institute of Standards and Technology (NIST)
- The Department of Commerce (DOC)
- The Naval Research Laboratory (NRL)
- The Naval Sea Systems Command Warfare Centers (NAVSEA) at Dahlgren, VA, and Newport, RI
- The Civilian Acquisition Workforce Personnel Demonstration Project (AcqDemo).

During the three decades of demonstration projects, an abundance of knowledge and practical experience were obtained regarding employing performance-based compensation measures. From these projects, nine components were deemed critical to implementing successful pay-for-performance compensation measures:

1. Align individual performance expectations with organizational goals.
2. Connect performance expectations to crosscutting goals.

3. Provide and routinely use performance information to make program improvements.
4. Require follow-up actions to address organizational priorities.
5. Use competencies to provide a fuller assessment of performance.
6. Link pay to individual and organizational performance.
7. Make meaningful distinctions in performance.
8. Involve employees and stakeholders to gain ownership of performance management systems.
9. Maintain continuity during transitions. (GAO, 2004, pp. 1-2)

By employing these elements, agencies were more likely to successfully establish a performance-based compensation program resulting in their transformation into a “high-performing organization [sic] [...] that [is] more results-oriented, customer-focused, and collaborative in nature, and ha[s] recognized that an effective performance management system can help them drive internal change and achieve desired results” (GAO, 2004, p. 1).

Each agency was authorized by the OPM to develop specifically tailored performance-based compensation programs designed to meet the particular needs of each organization. Each agency developed variations in its procedure to tie employee performance to job requirements, to link performance to awards or pay increases, to control the overall cost of the program, and to determine the manner in which the program was managed and communicated within the organizational hierarchy. Organizations evaluated employee performance derived from either organization-wide competencies; behavior related to accomplishing the organization’s mission, goals, and values; or position-based competencies (i.e., those actions related to successfully completing individual job requirements). Associated with a corresponding performance evaluation, compensation increases were generally applied in one of three categories: permanent pay increases, one-time awards, or a combination of the two. Employees receiving the highest performance evaluation qualified for the highest compensation increase, while lower marks received smaller amounts. Organizations like China Lake used a five-point performance evaluation scale, while other agencies used a four-increment rating scale. Since each organization was responsible for managing its overall

budget, innovative methods to handle salary increases were created. One such method was pay banding, which is allocating graduated percentage increases based on seniority; lower pay-band levels would receive a higher percentage increase than higher-level employees. Additionally, there were added training and administrative costs that organizations incurred when changing to their new compensation schemes. (GAO, 2004)

The success of these demonstration projects was too inconclusive to generalize to all federal agencies. However, of the 17 projects, 12 have permanently adopted performance-based compensation systems. Furthermore, the valuable lessons learned have paved the way for further research and a more performance-oriented federal workforce.

D. PERFORMANCE-BASED COMPENSATION COMPARISON STUDY

In Gibbs' (2006) study analyzing compensation among US Department of Defense scientists and engineers, valuable data were obtained on two early performance-based compensation demonstrations: the Performance Management and Recognition System (PMRS) and China Lake. These demonstrations were designed to add more flexibility into the pay structure to remain more competitive with the private sector in recruiting and retaining quality personnel to fill increasingly more technical job assignments. These pay plans would challenge the more rigid General Schedule (GS) pay structure comprised of 15 pay levels, each one including 10 steps, with raises "awarded primarily for seniority [time in grade] so that pay for performance came about chiefly through promotions" (Gibbs, 2006, p. 202).

1. Performance Management and Recognition System (PMRS)

Compared to the GS pay system, the PMRS offered a more flexible pay plan that awarded increased salary in the upper GS levels (Grades 13 through 15) based on performance evaluations (Gibbs, 2006). The PMRS was mandated by the *Civil Service Reform Act (CSRA) of 1978* to institute performance-based compensation in federal organizations (Perry & Petrakis, 1988). As designed, employees covered under the PMRS would receive compensation based on their performance evaluations. Employees

receiving evaluation appraisals of “fully successful or better [were] assured of receiving the full annual comparability adjustment and all or part of the equivalent within grade increase” (Perry & Petrakis, 1988, p. 361). Those workers rated above “fully successful” would be eligible for additional awards or bonuses, which were capped at a 2-percent increase if an employee received an evaluation rating that was two levels above “fully successful” (Perry & Petrakis, 1988, p. 361). Total bonus allocations were limited to no more than 1.5 percent of the total payroll. The first pay-for-performance, or merit-based pay system, implemented under the *CSRA* was “hailed as [a] means for bringing responsiveness and efficiency back to the federal sector” (Perry & Petrakis, 1988, p. 359). However, limitations in program execution left workers disenchanted and discouraged as the merit-based pay system did not provide adequate “funding for merit pay pools, [contained] pay inequities between managers and non-managers, and low validity of performance appraisal ratings” (Perry & Petrakis, 1988, p. 359).

The PRMS was considered a significant improvement over the original merit-based pay system that was first enacted after the *CSRA*. However, flaws were still present. The Government Accounting Office reported that more than 1/3 of the surveyed employees were dissatisfied with the 1.5-percent total payroll scheme that forced bonuses into a limited distribution, citing that “the manipulation of ratings undercuts the validity of the performance appraisal system” (Perry & Petrakis, 1988, p. 363). Other critics claimed that the PMRS failed to address the primary issue: improving employee performance (Perry & Petrakis, 1988). According to Perry and Petrakis (1988), additional arguments were made in the following areas:

- Bonuses should be larger—larger bonuses are more likely to sustain high performance.
- Promotions should be considered as a substitute for rewards—representing recognition of employee performance—and should be a permanent form of pay increase.
- Punishment was uncertain, as it was not clear how the PMRS addressed consistently underperforming employees.
- The differentiation between leavers vs. stayers was uncertain; it was vague how the PMRS affected functional turnover.

The PMRS included additional discrepancies. The seven critical components listed by the US Merit Systems Protection Board lay the groundwork to successfully implement performance-based compensation. The PMRS did not follow these components. In particular, inadequate funding seemed to limit the rewards to only 1.5 percent of the total payroll. The evaluation system was plagued as a “time-consuming and sometimes unpleasant task” in which supervisors had difficulty “measuring and documenting performance differentials” (Perry & Petrakis, 1988, p. 365). Employees, who were not confident that their performance would be accurately reflected in their evaluations, were provided little incentive to work hard. Furthermore, Perry and Petrakis (1988) argued that the inherently self-focused recognition system in performance-based compensation detracted from achieving organizational goals. Ultimately, the PMRS was terminated in 1993.

2. China Lake

The demonstration project at China Lake introduced a multi-tiered promotion ladder that rewarded more technical skills while using pay banding in five primary pay grades, in lieu of the 15 pay grades under the GS system. The compensation changes (which included wider pay bands) introduced to a select employee group of China Lake scientists and engineers were designed to create greater salary flexibility and performance incentives not present under the existing GS system (Gibbs, 2006). According to the Government Accountability Office (2004), the China Lake compensation changes were designed to:

- Develop an integrated approach to pay, performance appraisal, and classification;
- Allow greater managerial control over personnel functions; and
- Expand the opportunities available to employees through a more responsive and flexible personnel system. (p. 43)

In instituting a compensation demonstration project, China Lake applied several critical components that would later be identified by the US Merit Systems Protection Board (2006) as critical elements in performance-based compensation. China Lake’s management process was thoroughly involved in the compensation reform. From

modifying position responsibilities to supervisor reviews, employees involved in the demonstration project received constant feedback on their performance. Additionally, China Lake instituted a check-and-balance process that provided a secondary review of all performance evaluations and a grievance procedure for any employees dissatisfied with their review. Ultimately, the initial success of the trial run was evident in the increased quality of recruits at China Lake (Gibbs, 2006). Further evidence of China Lake's demonstration success occurred in 1994, when its compensation system was permanently signed into public law (GAO, 2004).

3. Summary

Gibbs' (2006) return to skills analysis of three different pay plans within the federal government provided mixed results. Table 15 shows the impact of the more flexible pay plans on the PMRS and China Lake test groups with reference to the GS pay system over the 15-year period from 1982-1996.

Table 15. Trends in Returns to Unobserved Skills in GS, PMRS, and China Lake Pay Plans between 1982-1996 (Adapted from Gibbs, 2006)

		Years of Service								
		1-5			6-10			11+		
GS		BA	MA	PhD	BA	MA	PhD	BA	MA	PhD
Engineer	1982	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Mathematician	1982	1.00	-	-	1.00	1.00	-	1.00	1.00	1.00
Scientist	1982	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Engineer	1996	0.92	0.96	0.91	0.93	0.91	0.89	0.84	0.90	1.01
Mathematician	1996	0.72	-	-	0.93	0.83	-	0.96	0.97	1.13
Scientist	1996	0.97	1.08	0.99	0.87	0.86	0.91	0.92	0.92	1.07
PMRS		BA	MA	PhD	BA	MA	PhD	BA	MA	PhD
Engineer	1983	-	-	-	1.00	1.00	1.00	1.00	1.00	1.00
Mathematician	1983	-	-	-	-	-	-	1.00	1.00	1.00
Scientist	1983	-	-	1.00	-	-	1.00	1.00	1.00	1.00
Engineer	1996	-	-	-	0.98	0.94	1.20	1.01	1.05	1.05
Mathematician	1996	-	-	-	-	-	-	1.02	1.10	1.00
Scientist	1996	-	-	0.83	-	-	1.01	1.05	1.05	1.07

China Lake		BA	MA	PhD	BA	MA	PhD	BA	MA	PhD
Engineer	1983	1.00	1.00	-	1.00	1.00	-	1.00	1.00	1.00
Mathematician	1983	-	-	-	-	-	-	1.00	1.00	1.00
Scientist	1983	-	-	-	-	-	-	1.00	1.00	1.00
Engineer	1996	1.09	1.15	-	0.90	0.98	-	0.99	1.04	0.97
Mathematician	1996	-	-	-	0.97	-	-	1.18	1.07	1.26
Scientist	1996	-	-	-	0.96	-	-	1.01	1.10	0.95

Represented in Table 15, employees who experienced a positive return to skills and subsequent increased salary are depicted with a value greater than one. Under the GS pay system, nearly all degree holders in each of the three occupational fields experienced a decreasing return to skill during their career. The two exceptions, however, included scientists with Master's Degrees in the lowest experience category and PhD holders with greater than 11 years of experience. Under the PRMS pay plan, PhD holders with 6-10 years of experience and all degree holders with greater than 11 years of experience observed a positive return to skills. At China Lake, employees experienced similar positive returns to skills in the most experienced category, in addition to engineers in the 1-5 years-of-experience group. (Gibbs, 2006)

The results of the PMRS and China Lake pay system demonstration projects are more consistent with the growth of salary and return to skills seen in the private sector. Depicted in Figure 30, the return to skills, as observed by the median salary, remains flat within the GS pay system. There is approximately the same salary differential between GS 7 and GS 15 employees at the start of their careers as there is toward the end. Thus, there is no observed return to skill. (Gibbs, 2006)

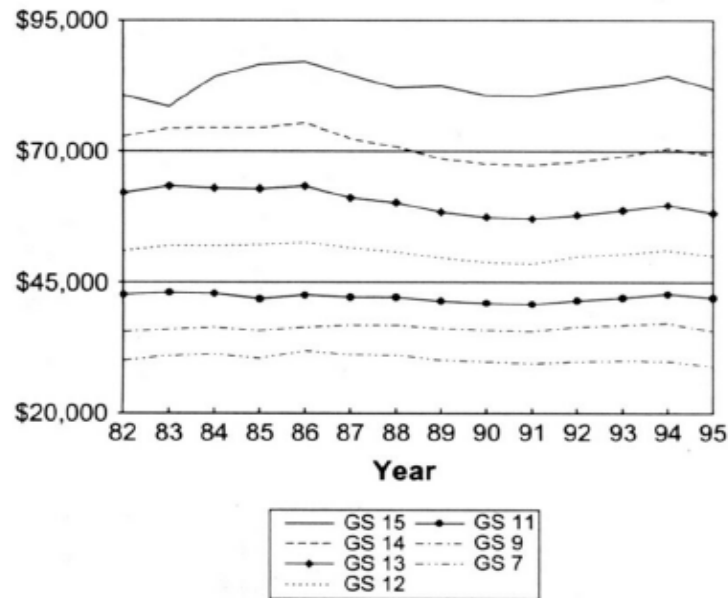


Figure 30. Median Salary by Grade, General Schedule Scientists and Engineers
(Gibbs, 2006, p. 203)

By comparison, Figure 31 shows a growing separation of return to skill throughout workers' careers. In the private sector, there is a growing separation between salaries paid at the lowest level (i.e., Level 1) and the highest level (i.e., Level 8) as workers gain experience. Therefore, the private sector tends to reward experience in a much more lucrative manner than is witnessed in the government sector. Level 1 and Level 8 employees do not continue to receive the same pay raise throughout their careers, which is unlike pay raises in the GS system. (Gibbs, 2006)

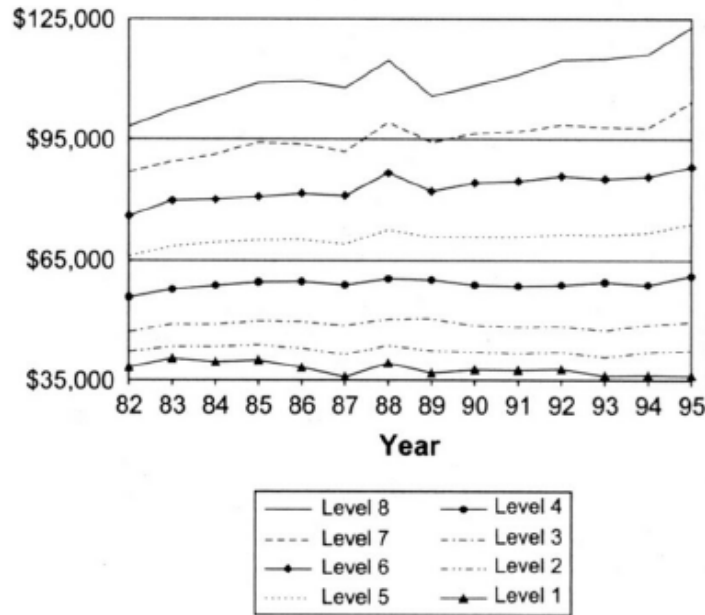


Figure 31. Median Salary by Level of Responsibility, Private-sector Engineers (Gibbs, 2006, p. 203)

Of great interest to this analysis is whether or not the more flexible pay systems created a greater ability to attract and retain quality employees. There appeared to be

little evidence that the DOD experienced any decline in its ability to attract and retain high-quality SEs [scientists and engineers] over the 1980s and early 1990s. Measured quality and performance of new hires relative to promotes, and of exits relative to stays, were essentially flat over the period. These findings hold for the most important federal pay plan, the General Schedule, as well as for two other plans that were intended to provide greater flexibility in personnel management. (Gibbs, 2006, pp. 212-213)

Analysis of Gibbs' (2006) study may suggest little need for the federal government to switch to a compensation structure that models the private sector. Because federal employment has significant intrinsic value that cannot be captured by simple economic models, results were not as conclusive as proponents of performance-based compensation would like to argue. Patriotism, stability, security, and a vast research budget are just some of the reasons cited in Gibbs' (2006) study that explain why the PMRS and China Lake pay models do not behave according to existing economic theory.

E. DEPARTMENT OF HOMELAND SECURITY AND NATIONAL SECURITY PERSONNEL SYSTEM PERFORMANCE-BASED COMPENSATION SYSTEMS

From early compensation demonstration projects conducted at select federal agencies across the United States, the Department of Homeland Security (DHS) and the National Security Personnel System (NSPS) have emerged with variations of performance-based compensation programs. These programs represent modifications to the more rigid General Schedule (GS) federal pay system and apply over 25 years of experience from the earlier performance-based compensation demonstration projects. The following sections provide a review of the performance-based compensation systems of these two programs.

1. Department of Homeland Security (DHS)

“In November 2002, Congress established the Department of Homeland Security and provided it human capital flexibilities to design a performance management system and specifically to consider different approaches to pay” (GAO, 2004, p. 2). The *Federal Register* published the Department of Homeland Security’s final regulations establishing the Human Resource Management System (HRMS) and “the affected subsystems [which] include those governing basic pay, classification, performance management, labor relations, adverse actions, and employee appeals” (DHS & OPM, 2005, p. 5,272). Under legislation approved by the *Homeland Security Act of 2002*, the HRMS represents a shift in the methodology of paying DHS employees. In lieu of the tenure-based system employed by the General Schedule pay plan, the DHS is developing a “far more market-sensitive [...] and performance-based classification and pay system” (DHS & OPM, 2005, p. 5277). The DHS compensation plan was designed so that employees would no longer receive a uniform annualized cost of living (base pay) adjustment along with a locality rate pay increase if their performance did not justify the salary increase. Future pay increases would be tied to individual performance standards, with better-performing employees capable of earning a larger annual increase. HRMS designers recognized that “this system does not assume that individuals are motivated by pay, but rather that we

have an obligation as an employer to reward the highest performers with additional compensation” (DHS & OPM, 2005, p. 5,277).

Integrating performance-based compensation into the massive DHS organizational structure has meant adopting a multi-year timeline for progressive implementation to over 110,000 DHS employees. This timeline originally established management and supervisor training in the first phase in 2005 with conversion of identified agencies completing subsequent transition by 2009. Due, in part, to the fact it has represented a fundamental shift in federal compensation practices in existence for over 50 years, this transition has not been accomplished quickly or without opposition. With significant American Federation of Government Employees (AFGE) union resistance and legislative pressure, the implementation process has slowed significantly. (CRS, 2005)

Developing a performance-based compensation system required developing a new pay classification out of the GS pay scale. “The current 15 grades and ten steps of the General Schedule pay system will be abolished and replaced, within each occupational cluster, by open pay bands without steps” (CRS, 2005, p. 3). HRMS designers developed functional work areas organized by type of work, qualifications, and competency, with four pay levels for each pay band. These new levels are identified as:

- Entry/development
- Full performance
- Senior expert
- Supervisory (CRS, 2005, p. 3).

Promotion and salary progression through these four pay bands are designed to be competency-based and solely dependent on how well employees perform their jobs.

To determine compensation policy and the proper amount of salary increase within this structure, the Homeland Security Compensation Committee was established. Chaired by the DHS Undersecretary for Management and consisting of 14 members, its responsibilities include establishing “the annual allocation of funds between market and performance pay adjustments and the annual adjustment of rate changes and locality and

special rate supplements” (CRS, 2005, p. 30). The design under HRMS permits employees to realize greater control over their career and salary progression, as they are no longer forced to wait for longevity-based step increases.

The lengthy process of merging 22 individual agencies under the umbrella of the Department of Homeland Security Performance Management System has begun with a limited performance-based compensation program affecting senior DHS employees. It has now been “deployed [...] to approximately 10,000 employees in multiple components and [training has been provided to] 350 senior executives and more than 11,000 managers and supervisors in performance leadership” (DHS, 2007, p. 6). Court rulings siding in favor of the AFGE, concerned about employee bargaining rights, severely hindered the performance-based pay system implementation progress within DHS (“Judge blocks merit pay at pentagon,” 2006). Union intervention in the HRMS roll-out resulted in a limited performance-based pay system similar in size to some of the original demonstration projects. This, however, signifies that the foundation has been established to continue performance-based compensation throughout DHS.

2. National Security Personnel System (NSPS)

In November 2003, the National Security Personnel System (NSPS) was enacted by the 2004 *National Defense Authorization Act* as the performance-based management system to cover more than 700,000 federal Department of Defense (DoD) employees (GAO, 2005). Two years later, the DoD (2005) published final regulations establishing the NSPS and provided forward progress regarding the implementation of performance-based compensation.

NSPS is designed to promote a performance culture in which the performance and contributions of the DoD civilian workforce are more fully recognized and rewarded. The system offers the civilian workforce a contemporary pay-banding construct, which will include performance-based pay. As the Department moves away from the General Schedule system, it will become more competitive in setting salaries and it will be able to adjust salaries based on various factors, including labor market conditions, performance, and changes in duties. (DoD, 2005a, p. 66,118)

According to the Government Accountability Office (2007a), the NSPS is comprised of three major components:

1. A performance-based compensation management system
2. An appeals process
3. A labor relations system.

Under the new performance-based compensation management system, one of the most apparent changes is a new pay plan that uses pay bands in lieu of the 15-grade, 10-step GS pay plan. Figure 32 is one of the four new NSPS pay plans (for the Standard Career Group) replacing the GS pay system displayed in Figure 33. Depending on the occupational career group, the NSPS has created three or four significantly wider pay bands instead of the 15 pay grades associated with the GS system. These four pay plans correspond to new career groups: the Standard Career Group, the Scientific & Engineering Career Group, the Medical Career Group, and the Investigative & Protective Services Career Group. Within career groups, there are pay schedules that represent the type of work an employee performs and the job competencies he or she possesses. (NSPS, 2008b)



Department of Defense
National Security Personnel System
Worldwide Pay Table



Schedule #3

Issue Date: 06 JAN 2008

Standard Career Group			
PAY SCHEDULES		BASE SALARY (PER ANNUM)	
Professional/Analytical (YA)	Minimum		Maximum
Pay Band 1	\$26,008	-	\$62,593
Pay Band 2	\$39,407	-	\$89,217
Pay Band 3	\$77,018	-	\$130,211
Technician/Support (YB)	Minimum		Maximum
Pay Band 1	\$16,880	-	\$38,060
Pay Band 2	\$32,217	-	\$56,973
Pay Band 3	\$47,679	-	\$75,025
Supervisor/Manager (YC)	Minimum		Maximum
Pay Band 1	\$32,217	-	\$62,593
Pay Band 2	\$57,146	-	\$110,691
Pay Band 3	\$80,302	-	\$130,211
Student (YP)	Minimum		Maximum
Pay Band 1	\$16,880	-	\$62,593

Authority: This schedule of minimum and maximum rates has been established under the authority of paragraphs 9901.321 and 9901.322 of title 5, Code of Federal Regulations.

[Standard Local Market Supplements](#)

[Target \(Occupation\) Local Market Supplement](#)

Effective Date: 6 January 2008
Supersedes Schedule Issued: 7 January 2007

Figure 32. DoD NSPS Standard Career Group Pay Plan
(NSPS, 2008a, p. 1)

**SALARY TABLE 2008-GS
INCORPORATING THE 2.50% GENERAL SCHEDULE INCREASE**

EFFECTIVE JANUARY 2008

Annual Rates by Grade and Step

Grade	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	Step 9	Step 10	WITHIN GRADE AMOUNTS
1	\$ 17,046	\$ 17,615	\$ 18,182	\$ 18,746	\$ 19,313	\$ 19,646	\$ 20,206	\$ 20,771	\$ 20,793	\$ 21,324	VARIES
2	19,165	19,621	20,255	20,793	21,025	21,643	22,261	22,879	23,497	24,115	VARIES
3	20,911	21,608	22,305	23,002	23,699	24,396	25,093	25,790	26,487	27,184	697
4	23,475	24,258	25,041	25,824	26,607	27,390	28,173	28,956	29,739	30,522	783
5	26,264	27,139	28,014	28,889	29,764	30,639	31,514	32,389	33,264	34,139	875
6	29,276	30,252	31,228	32,204	33,180	34,156	35,132	36,108	37,084	38,060	976
7	32,534	33,618	34,702	35,786	36,870	37,954	39,038	40,122	41,206	42,290	1084
8	36,030	37,231	38,432	39,633	40,834	42,035	43,236	44,437	45,638	46,839	1201
9	39,795	41,122	42,449	43,776	45,103	46,430	47,757	49,084	50,411	51,738	1327
10	43,824	45,285	46,746	48,207	49,668	51,129	52,590	54,051	55,512	56,973	1461
11	48,148	49,753	51,358	52,963	54,568	56,173	57,778	59,383	60,988	62,593	1605
12	57,709	59,633	61,557	63,481	65,405	67,329	69,253	71,177	73,101	75,025	1924
13	68,625	70,913	73,201	75,489	77,777	80,065	82,353	84,641	86,929	89,217	2288
14	81,093	83,796	86,499	89,202	91,905	94,608	97,311	100,014	102,717	105,420	2703
15	95,390	98,570	101,750	104,930	108,110	111,290	114,470	117,650	120,830	124,010	3180

Figure 33. 2008 GS Salary Table
(OPM, 2008, p. 1)

One of the main differences between the pay systems shown in Figure 32 and Figure 33—elimination of the longevity-based step increase within pay grades—is fundamental to the decision to shift to NSPS. Designers of NSPS “believe Congress and the American people expect their public employees to be paid according to how well they perform, rather than how long they have been on the job” (DoD, 2005a, p. 66,124). Further support is contained within NSPS’ mission to “place the right civilian employee in the right job with the right skills at the right time at the right cost” (NSPS, 2004, p. 6). Performance-based compensation supports this mission statement.

a. Performance Management

The Performance Management System of NSPS is a five-step process depicted by the Performance Management Lifecycle shown in Figure 34. During this lifecycle, employees work closely with their supervisors to develop the specific job requirements of the individual position and to attain the level of performance that becomes the basis for the year-end evaluation.

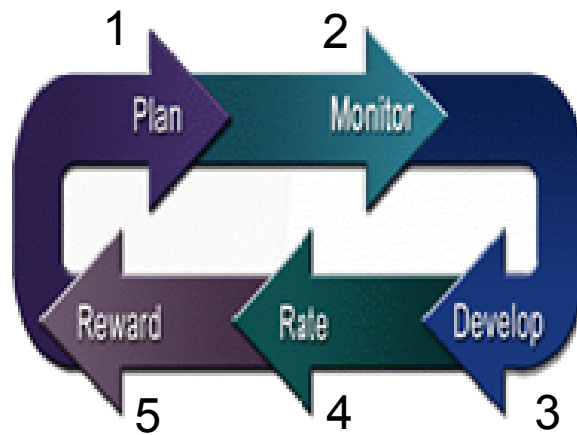


Figure 34. Performance Management Lifecycle
(Adapted from NSPS, 2008b)

During the Plan phase, Step 1, supervisors and employees establish the job objectives and components that determine job success. During the Monitor and Develop phases, Step 2 and Step 3, continual communication occurs between employee and supervisor. Throughout this process, employees are kept informed of their progress and any areas in which they may require further improvement. The next phase, Step 4, is the Rate Phase—when the supervisor writes the employee evaluation for the covered period. Employees receive performance-based compensation in the Reward Phase, Step 5, for evaluations that are 3.0 or better, based on a five-point scale. Employees earning a performance evaluation of a 1.0 or 2.0 rating are not eligible to receive a performance-based salary increase. (NSPS, 2008b)

b. Performance-based Compensation Component

The performance-based compensation component under NSPS legislation corresponds to annual performance evaluations and is paid in addition to cost-of-living adjustments. Employee performance is the combined average of all performance categories in an employee's occupational career group. An evaluation of 5.0 on the five-point scale represents the top performance rating and guarantees the largest performance-based compensation increase, while performance ratings of 1.0 and 2.0 represent below

average performance and are not associated with performance increases. According to the NSPS (2008c), the following performance descriptions are associated with each performance rating:

- 5—Role Model
- 4—Exceeds Expectations
- 3—Valued Performer
- 2—Fair
- 1—Unacceptable

The amount of performance-based increase is calculated as a function of the employee's average evaluation rating and the base salary. Lower-performing employees with a 2.0 performance rating may still be authorized to receive a local and inflationary cost-of-living salary increase, while 1.0-rated performers are not authorized a salary increase. In addition to performance-based compensation payouts, 5.0-rated employees may also receive an additional pay increase, called an Extraordinary Pay Increase. Additionally, any team member with over a 3.0 performance rating may be eligible for Organizational/Team Achievement Recognition (OAR). These are additional performance-based compensation awards may be awarded as salary increases, bonuses, or a combination of the two compensation vehicles (NSPS, 2008c).

c. NSPS Payout

On January 24, 2008, more than four years after the *National Defense Authorization Act* established NSPS and its performance-based compensation system, many of the 110,000 federal employees in the first phase of NSPS implementation received their first performance-based annual pay raise. The average NSPS pay raise represented a 5.9-percent salary increase plus a 1.7-percent bonus (not be added to the base pay for next year's calculations), or a 7.6-percent total increase. However, 0.2-percent of the employees received no raise at all. Compared to the previous GS pay system, the majority of the federal employees fared significantly better under the NSPS. By comparison, the average GS pay raise was only 3.5 percent. And, though the majority earned significantly more than they would have under the GS pay system, 5.13 percent of

the employees received a smaller pay raise. The 2008 payouts correspond to 57 percent of the employees receiving a rating of 3.0; 36 percent of the employees receiving a 4.0 rating; and 5.0 percent of the employees receiving the highest rating of 5.0 (NSPS, 2008d). Thus, the 5.13 percent who received a smaller increase under the NSPS represent a combination of the 0.2 percent who received no raise as a result of 1.0 or 2.0 performance ratings and 5,425 employees who received a rating of 3.0 or “valued performer” rating, but still earned a smaller increase. (Barr, 2008, p. 1)

F. PRIVATE-SECTOR PERFORMANCE-BASED COMPENSATION

Civilian organizations searching for methods with which to provide a competitive advantage in recruiting, enabling, and retaining quality employees have routinely turned to performance-based compensation to achieve their goals. Ideally, performance-based compensation helps accomplish organizational objectives through a multi-faceted process of:

- Attracting and retaining quality performers.
- Providing an incentive that aligns employee activities with organizational objectives.
- Providing motivation to develop process improvement.
- Providing teamwork and collaboration.

Where successfully implemented, these results may achieve financial success and employee satisfaction; however, unsuccessful execution “can have a destructive effect on intrinsic motivation, self-esteem, teamwork, and creativity” (Beer & Cannon, 2004, p. 4). The Corporate Leadership Council (2004) provides interesting insight pertaining to employee behavior, motivation, and compensation:

While rational incentives may create compelling reasons for employees to remain with organizations and meet basic performance requirements, it is the employees who derive pride, inspiration, and enjoyment from their job and organization who put forth the highest levels of effort. In fact improvements in emotional commitment can produce three to seven times the total impact on discretionary effort achieved through improvements in rational commitment. (p. 36)

Data from the Corporate Leadership Council's 2004 *Employee Engagement Framework and Survey* further support this statement. Satisfaction with total compensation resulted in a 9.1-percent increase in discretionary effort and a 21.1-percent increase in employees' intent to retain (CLC, 2004). These numbers show the effect compensation has on two functions of a performance-based compensation system: the ability to motivate employee effort and the ability to affect employee retention. The next section discusses two large corporations that have opposite experiences in implementing performance-based compensation:

- PepsiCo, the international food and beverage company
- Hewlett-Packard (HP), the American-based technology company specializing in the computer sector

1. Successful Implementation

PepsiCo implemented a dual-performance evaluation system that measures employee performance in two areas: people objectives and business objectives. People objectives focus on “managing and developing people, demonstrating teamwork and collaboration, and ensuring personal growth and development,” while business objectives focus on positive corporate growth and corporate profits (CLC, 2005, p. 9). Using a five-point performance evaluation scale, both metrics are linked to performance-based compensation for all employees and have bonuses and long-term incentives for select employees. Introduced in 2001, this evaluation structure has:

increased manager commitment to people management as well as higher levels of employee satisfaction with the performance management process. In addition, PepsiCo indicates the practice has fueled and sustained a culture shift among employees; dedication to people management, teamwork, and self development is now an expected competency within the organization. (CLC, 2005, p. 5)

Several features of PepsiCo's dual-performance rating system are credited, in part, for the success of its evaluation program. First, PepsiCo keeps the people-objectives rating and the business-objectives rating separate at all times. This eliminates one rating from influencing the other. Second, the people-rating is given significant clout, affecting “34 percent of managers' merit increases and individual bonuses” (CLC, 2005, p. 5).

Third, managers performing poorly in either rating category are placed on a performance-improvement program designed to achieve positive results in weak areas. Lastly, “a forced distribution overlay, introduced in 2004, enables PepsiCo to better differentiate senior executives’ performance and more accurately award long term incentives to ‘top’ performers in the organization” (CLC, 2005, p. 5).

PepsiCo reports that its performance rating system has been quite successful, which results in better manager accountability and performance separation for people management, a positive culture shift within the organization, and a level of quality management that has transcended across all work sectors—improving both individual and team effort (CLC, 2005). Furthermore, PepsiCo states that its success is owed to several key components of its management system:

- Separate performance ratings applied to nearly all employees
- A well-defined performance criteria in both people and business objectives
- Thorough evaluations maintaining the separation between people and business categories
- Performance-based compensation separately linked to employee ratings in each category
- Application of appropriate performance objectives and awards to senior leadership
- A means to correct underperforming employees (CLC, 2005, p. 8).

In developing people objectives, PepsiCo’s management has developed four specific metrics that correspond with organizational objectives and are tied to specific areas of responsibility. Employees’ accountability in the areas of “creating a diverse and inclusive organization, managing and developing people, teamwork and collaboration, and personal development and growth” is crucial for the growth of the individual and the organization as well (CLC, 2005, p. 10). Management works closely with its subordinate employees to align personal employee objectives with organizational objectives.

During the evaluation process, managers hold each employee to the mutually developed standards. In this process, management receives 360-degree feedback: from the employee, from the employee’s subordinates, from team members, from customers,

and from organizational surveys. The process has one final step—a manager calibration meeting—which reviews ratings and ensures accuracy before assigning the final employee ratings. Employees receive a second rating on their business performance, as well. Together, these ratings determine the overall performance-based compensation, with people ratings affecting 34 percent of the overall merit increase. Accountability to correct deficient performance in either rating category is included in this rating process. Employees receiving a 2.0 or lower rating must complete a “performance improvement plan” with a 60-day to 6-month deadline to produce results (CLC, 2005, p. 16). Employees failing to improve within their allotted time are either dismissed from the company or forced to change positions within the company. (CLC, 2005)

Since the program's inception in 2001, PepsiCo has reported a “positive culture change at PepsiCo; employees embrace the People Management focus and are motivated by the ability to drastically improve their performance in an attainable and clearly defined category” (CLC, 2005, p. 18).

2. Failed Implementation

In the early 1990s, Hewlett-Packard (HP) managers in thirteen divisions and sites attempted performance-based compensation initiatives to improve company performance. No initiative survived the test of time, although this does not imply that all aspects of the programs were unsuccessful. Beer and Cannon (2004) discussed details of five of the thirteen HP compensation initiatives in their study, *Promise and Peril in Implementing Pay-For-Performance*:

- The San Diego site
- Boise Printer Formatter Shop
- PRCO Loveland
- Colorado Memory Systems
- The Workstations Group.

The San Diego site developed “team pay-for-performance (PFP)” to motivate team goals in the areas of process improvement, production, and quality (Beer & Cannon, 2004, p. 6). They developed three performance metrics (i.e., Levels I, II, and III); team

members would receive monthly performance payouts if they achieved a certain level of performance during the previous month. Additionally, the San Diego site created a “skill-based pay system called pay-for-contribution (PFC)” which rewarded employees based on learning new competencies within the team organization (Beer & Cannon, 2004, p. 7).

The results of these programs were mixed. Many employees prospered during the PFP program, with most teams achieving Level II or III performance marks. As a result of the unexpected success and resulting expense, in part due to the low performance metrics, managers were forced to raise the performance standards and to make them more stringent. This change had severe consequences, as it eroded trust that management had previously developed with employees. Some workers viewed the change as an unprovoked reduction in earned salary. Another side-effect occurred as a bi-product of the success some teams experienced; it developed competition that prevented further teamwork and team-building. By comparison, no one liked the PFC skill-based pay system. It did not develop into the competency-developing tool management had previously predicted. The institution of performance testing had the exact opposite effect, as employees could actually drop in pay level by performing poorly on these tests. The results of these efforts forced the San Diego site to drop both pay initiatives approximately one year after they were established.

The Boise Printer Formatter Shop implemented a skill-based pay system as a function of both individual and team performance. It was administered, in part, through peer evaluation. Compensation could be adjusted within a pay level as a result of individual employee productivity, as well as through team performance. Like the San Diego site, this HP division found itself paying more than it expected in performance payouts. And, similar to the San Diego site, competition among employees created an environment that was not conducive to teamwork. Due to the unprecedented payouts, negative competitive atmosphere, difficulties in administering peer evaluations, and a perception that employees were overly focused on pay instead of on organizational goals, the Boise site never experienced the intended results; it subsequently dropped the program. (Beer & Cannon, 2004)

PRCO Loveland, a fabrication division, attempted to initiate performance-based compensation as an incentive to meet end-of-period goals. The division did not reach the end-of-the-month target; therefore, PRCO Loveland never had to pay the one-time goal or attainment bonus. Though workers never received their bonus, employee productivity and motivation improved. However, an unintended consequence resulted when some of the employees felt slighted by what they perceived as a “bribe [...] to reach a goal they were already motivated to reach” (Beer & Cannon, 2004, p. 10). Management discontinued this approach in future goal setting.

Colorado Memory Systems (CMS), a company acquired by HP, developed a “gain sharing program [...] to] increase the following desired behaviors: individual initiative and responsibility; willingness to learn; adaptiveness [sic]; teaming and collaboration; hustle; willingness to confront conflict; and focus and attentiveness” (Beer & Cannon, 2004, p. 10). Designed to motivate these behaviors and bring previous CMS employees’ salaries closer to the HP salary range, it positively affected employee behavior in the areas of teamwork, communication, and focus. However, issues regarding pay equality, long-range goal orientation, and program metrics led to another short-lived initiative at HP.

Finally, the Workstation Group introduced a one-time incentive package to motivate program managers and engineers in introducing a new product to the market. Successful in this endeavor, HP rewarded managers with stock and salary rewards, while engineers received a salary increase when the product was delivered six months ahead of schedule. Not without criticism, however, many employees, “including the vice president in charge of personnel, believed that the perception of high priority was the most important motivating factor leading to the early completion of the workstation” (Beer & Cannon, 2004, p. 11). Ironically, “[a]n HP survey showed that 70 percent of the employees felt that they would have worked just as hard on the project without the incentive program. But [...] 60 percent of the employees surveyed recommended that incentive programs be used with other projects at HP” (Beer & Cannon, 2004, p. 11).

By the mid-1990s, all thirteen performance-based compensation initiatives had been discontinued or cancelled under company reorganization. Some programs had

achieved their intended goals, such as delivering a product to the market ahead of schedule or meeting performance goals. However, managers in each of the HP divisions individually determined that the continued expense of these performance-based compensation initiatives was not cost effective compared to the existing HP business model. The business model that included trust and communication between manager and employee, a team-oriented work culture, and a proven successful compensation program proved difficult to improve.

G. PROBLEMS IMPLEMENTING PERFORMANCE-BASED COMPENSATION

Labor economics theory suggests greater earning profiles are associated with increased human capital, which is associated with greater productivity (Medoff & Abraham, 1980; Ehrenberg & Smith, 2006). Employees who have more experience have a greater accumulation of human capital and operate at a higher level of productivity than less-experienced and low-valued capital employees. Correspondingly, more productive employees are paid an increased wage due to their increased human capital and added worth to the employer. However, “there exists no evidence that corresponding pieces of the experience-earnings and experience-productivity profiles have the same sign” (Medoff & Abraham, 1980, p. 704). However, Medoff and Abraham (1980) argue that it is “very difficult to measure an individual worker’s productivity in an advanced industrial society” (p. 704). Additionally, there is little evidence that more productive employees are necessarily operating at a higher level of performance than what is expected of them.

Regarding performance-based compensation, Turner (2006) claims if motivation is driven by expectancy theory, then incentive-based compensation should be a relatively large percentage of employee compensation.

Motivating employees by using performance-contingent rewards is a long-established management practice. Pay for performance is used to promote two ends. First it is expected that these systems will motivate employees to increase their effort and thereby their performance. Expectancy theory clearly posits that effort is increased when meaningful rewards are offered

[...] Second, these compensation plans are often introduced to better align the efforts of employees with organizational goals and objectives set by management. (Turner, 2006, p. 23)

Regardless of the difficulties associated with measuring productivity and individual performance, companies utilizing performance-based compensation are cognizant of the fact that they must reward their employees accordingly. In performance-based compensation schemes, top performers in a particular grade receive a proportionately higher amount of compensation relative to the average or the below-average performers in that same grade. However, “evidence from research on compensation plans indicates that explicit financial rewards in the form of transitory performance-based bonuses seldom account for an important part of a worker’s compensation” (Baker et al., 1988, p. 595). This evidence leads researchers to question if employees are really receiving performance-based compensation.

Medoff and Abraham (1980) analyzed two large manufacturing firms, Company A and Company B, with their results shown in Table 16. Employee performance ratings are shown in column 1, the earnings premium relative to the lowest performance rating is represented in column 2, and the percent of employees in that level receiving the performance grade is depicted in column 3.

Table 16. Salary Premiums Associated with Performance Ratings, and Frequency Distribution of Performance Ratings, for Managers in Two Large Manufacturing Firms
(Baker et al., 1988, p. 595, as adapted from Medoff & Abraham, 1980)

Performance Rating	Salary Premium Relative to Lowest Performance Rating	Percent of Sample Receiving Performance Rating
(1)	(2)	(3)
<i>Company A (4,788 managers):</i>	%	%
Not Acceptable	-0-	.2
Acceptable	1.4	5.3
Good	5.3	74.3
Outstanding	7.8	20.2
<i>Company B (2,841 managers):</i>		
Unacceptable	-0-	-0-
Minimum Acceptable	-0-	-0-
Satisfactory	-0-	1.2
Good	1.8	36.6
Superior	3.6	58.4
Excellent	6.2	3.8

Their findings indicate that the within-grade salary differential of employees in professional and managerial positions was minimal. Medoff and Abraham (1980) concluded that even though experience was rewarded by higher salaries, employee experience did not result in a significantly higher level of performance. Both Company A and Company B administered performance evaluations by employees' immediate supervisors indicating "how well an individual in the year of evaluation, is carrying out the responsibilities of his or her job" (Medoff & Abraham, 1980, p. 708). Employees in Company A earning "not acceptable" or "acceptable" ratings were below-average performers; "good" was an average performance mark; and "outstanding" was awarded to the top performers. In Company B, employees earning "satisfactory" or "good" ratings were below-average performers; employees receiving "superior" were average

performers; and marks of “excellent” indicated top performance. Though Company B had two lower levels of performance, no employees received those marks. (Medoff & Abraham, 1980)

There is a 7.8-percent wage difference between the lowest and the highest ranking employees in Company A, while Company B shows only a 6.2-percent difference between the same employee performance classifications. Additionally, Medoff and Abraham’s (1980) findings show that while nearly 95 percent of Company A’s employees received ratings of “good” or better, only 20.2 percent were above-average performers. Meanwhile, Company B evaluated over 98 percent of their employees as “good” or better, but only 3.8 percent were recognized as above average. Furthermore, their study showed only a 2.5-percent and a 2.6-percent earnings premium between employees who received an average performance rating and those that earned the top performance mark for Companies A and Company B respectively. (Medoff & Abraham, 1980)

In a 1985 study by Guzzo, Jette, and Katzell, the effects of monetary compensation on worker productivity were measured. The authors concluded there were no performance benefits from financial rewards. According to Turner (2006), the data from the study:

produced no significant effects for financial incentives. The non-significant result for financial incentives suggests that, on average, the motivational value of incentives across these studies was zero. The use of financial incentives did not produce performance improvement. (pp. 26-27)

Additional arguments contend that “money actually lowers employee motivation, by reducing the intrinsic rewards that an employee receives from the job” (Baker et al., 1988, p. 596). Some performance-based compensation critics claim that employee motivation is decreased due to improper evaluation and performance measurements. “[E]vidence indicates that pay is not very closely related to performance in many organizations that claim to have merit increase salary systems [...] suggest[ing] that many business organization do not do a very good job of tying pay to performance”

(Baker et al., 1988, p. 595). Performance-based compensation may even affect quality as employees become more concerned with chasing a performance bonus. Others assert additional negative side-effects of performance-based pay: deteriorated organizational morale and reduced productivity. These spillover effects more likely occur in organizations in which the performance-based compensation is incongruent with the current organizational culture; such was the case with Hewlett-Packard.

Furthermore, union pressure and court cases, filed by the American Federation of Labor and Congress of Industrial Organizations (AFL-CIO) and the American Federation of Government Employees, have stalled the implementation of performance-based compensation programs on the grounds of collective bargaining rights issues. Court cases have blocked, delayed, and forced revision to DHS and NSPS performance-based compensation programs (“Judge blocks merit pay at pentagon,” 2006). Union workforces in the private sector face similar challenges, as the AFL-CIO are involved from the planning stages to the implementation phases of performance-based compensation programs (DoD, 2005a). Unions are strongly involved in performance-based compensation transition processes, highlighted by 36 labor unions’ participation in the NSPS’ “meet-and-confer process” during the initial planning phase (DoD, 2005a, p. 66122).

H. CHAPTER SUMMARY

Arguments exist on both sides of the spectrum as to the organizational benefits of instituting performance-based compensation. What works in one industry may not work in another. However, prior to rushing to judgment and implementing a performance-based compensation system, organizations must conduct a thorough top-to-bottom organizational analysis that includes cultural and strategic objectives. In order to establish an effective performance-based compensation system, an organization must first understand what it expects from such a system. Will it be a vehicle for increasing performance, improving retention, or organizational change? It is essential for Navy leadership and policy makers to respect both the intended consequences and the unintended spillover effects when considering performance-based components of the SWO retention bonuses—as newly minted weapons to combat the Surface Warfare Officer retention problem.

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VI. MODELING THE RETENTION EFFECT OF ADDING A PERFORMANCE-BASED COMPONENT TO THE SWO CRITICAL SKILLS BONUS

A. OVERVIEW

The SWO community has identified retention issues at critical ports of exit in the mid-grade and senior level officer ranks (Crayton et al., 2002; Commander Naval Surface Forces, 2008b). Current SWO incentive pays offered to junior Surface Warfare Officers, (i.e., SWOCP and Junior SWO CSRB) are designed primarily to capture and retain officers early in their careers. Combined, these incentive pays allocate up to \$75,000 for those officers who commit to serving through their department head tours, or approximately 10.5 YCS (Chief of Naval Operations, 2005b; Navy Personnel Command, 2008a). These two retention bonuses address the requirement to retain 275 SWO department heads; however, they do not directly combat the inventory shortage in the mid-grade and senior officer ranks at later critical ports of exit (Monroe & Cymrot, 2004). As depicted in Figure 8 and Figure 9, it takes several years for increased retention at 9 YCS to spill over and influence later SWO inventory shortages. Therefore, a more immediate solution is required to directly address retention at the 13-year port of exit to affect the current SWO inventory through 15 YCS and beyond. The following data analysis addresses retention at the 13-year critical retention point, utilizing the SWO Critical Skills Bonus to capture mid-grade officers. The existing SWO Critical Skills Bonus is void of a performance metric and does not discriminate officer quality or economic rents of retention decisions for the targeted SWO population. The following models examine the potential retention effects of adding a performance-based component to the SWO Critical Skills Bonus.

The first section describes the dataset and sample utilized in the multivariate econometric and optimization models. The second section provides a description of the dependent and independent variables. The third section details the methodology employed in developing the 13-year retention, tier characteristics, pay elasticity, and

optimization models. Section four explains the hypothesized effects of the independent variables of interest. The fifth section discusses the descriptive statistics, and the sixth section presents the results of the econometric regression models and optimization models. The last section addresses model limitations.

B. DATASET AND SAMPLE

1. DMDC Dataset

To analyze retention among Surface Warfare Officers, a comprehensive dataset was provided by the Defense Manpower Data Center (DMDC). The dataset consists of personnel records for 20 officer cohorts (separated by commissioning year) and includes all Navy officers who were commissioned Ensigns (O-1) from fiscal year (FY) 1987 through FY 2006. The personnel records contain three data entry points: the record at the time of accession, the current record, and the loss record. The accession record displays the pertinent data for each officer at time of commissioning. The current record shows a snapshot of data at the end of FY 2006 for officers remaining on active duty. For officers who separated from active duty prior to the end of FY 2006, the current record represents the last month the officer was on active duty. Finally, the loss record provides data for naval officers at time of separation from active duty, if they indeed separated.

These personnel records, which are annual snapshots of the officers' pay in December of the respective calendar year, were merged with corresponding pay records over the 20-year period. Pay records capture officers' total cash compensation, including: basic pay, allowances, special and incentive pays, and bonuses. The merged dataset contains personnel data (coded as fixed over time) combined with time-series pay data.

2. Surface Warfare Officer Sample

To focus on the surface warfare community, only officers with the current designators of 116x (i.e., SWO in training) or 111x (i.e., qualified SWO) were included in the analysis (Director of Manpower, Personnel, Training, and Education Policy

Division, 2007a).²³ Furthermore, the sample was restricted to officers who possess at least a bachelor's degree and were commissioned between the ages of 20 and 42. Since the SWO promotion process relies on lineal numbers, the sample does not include officers who commissioned through the United States Naval Academy (USNA), since USNA graduates have a systematic promotion difference based on lineal number assignment when compared to officers commissioned through other sources (Chief of Naval Operations, 2005a). These restrictions provide a SWO sample of 9,110 officers.

Time to promote to Lieutenant Commander (O-4) was utilized as a proxy for performance, which restricted the sample further. Officers who did not promote to O-4 are left out of the regression models. To analyze realistic promotion timing, the sample only includes officers who promoted to O-4 between 9 YCS and 12 YCS. Therefore, the resultant sample size is 1,331 SWOs.

C. DESCRIPTION OF VARIABLES

1. Dependent Variables

a. 13-year Retention

The 13-year retention variable (i.e., *retention13yr*) is a dichotomous variable that captures whether or not a SWO retained to at least the first day of the thirteenth year of commissioned service. This variable considers officers who remained in the surface warfare community and accumulated enough active duty time to have reached at least 13 YCS. Of the 1,331 sample size, 902 officers remained on active duty long enough to reach 13 YCS by the end of FY 2006.

²³ The fourth digit of the officer designator (represented by an "x") defines the current duty status of the officer. A "5" indicates that the officer is in the Navy Reserve; while a "0" indicates that the officer is in the Regular Navy on active duty. (Director of Manpower, Personnel, Training, and Education Policy Division, 2007a)

b. Performance Tiers

To create a proxy for performance, the sample was categorized by the elapsed time from commissioning date to the date of promotion to O-4. Previous studies have shown that promotion is a better proxy for performance than performance evaluations (FITREPS). FITREPs only identify a portion of performance and exhibit grade inflation, where performance grades are skewed toward the higher end. Medoff and Abraham (1980) found that performance ratings are not strongly correlated with wages. Moreover, Gibbs (1995) discovered that time in grade for a less structured civilian firm is the best predictor of performance. Therefore, a more comprehensive performance measure is required—time to promotion. This measure is likely to include more performance (and ability) information than FITREPs, such as: advanced degrees, training, professional qualifications, visibility in past job assignments, joint education and assignments, and personal awards.

Based on the three-year timeframe for promotion to O-4, from 9 YCS to 12 YCS, the sample was divided into three performance categories that correspond to the year of commissioned service in which officers promoted to O-4. Table 17 depicts the division of the sample.

Table 17. Definition of Performance Categories

Performance Category	Variable Name	Time to Promote to O-4 (in YCS)	Time to Promote to O-4 (in Days)	Promotion Zone Categories
Tier-1 Performers	<i>tier1perform</i>	9 – 10 YCS	3287 – 3652 days	Below Zone
Tier-2 Performers	<i>tier2perform</i>	10 – 11 YCS	3653 – 4017 days	In Zone
Tier-3 Performers	<i>tier3perform</i>	11 – 12 YCS	4018 – 4382 days	Above Zone

Based upon the O-4 promotion opportunity as established by the Department of Defense, this distribution approximates the Navy’s promotion tier system (Yardley et al., 2005; Secretary of the Navy, 2006). Tier-1 performers correspond to “below zone” promotions; tier-2 performers proxy those promoted “in zone,” and tier-3 performers represent those SWOs who promoted “above zone” (Secretary of the Navy,

2006, pp. 8-9). These promotion categories rank the SWO sample by relative level of performance, with tier 1 as the highest level of performance and tier 3 as the lowest level of performance. Each performance variable (i.e., *tier1perform*, *tier2perform*, and *tier3perform*) is a dichotomous variable that takes on the value of:

- 1 if a SWO belongs in that category; or
- 0 if that SWO is a member of another performance category.

2. Independent Variables

a. Accession Age

The accession age variable (i.e., *age*) is a continuous variable that represents the age (in years) at which the SWO was commissioned. This variable is a proxy for the maturity level at time of accession. Older officers have more years of life experience and may act more maturely, while younger officers are generally inexperienced and less seasoned. Though not perfectly correlated with accession age, maturity level may indirectly impact qualifications, education, sub-specialty codes, Joint Professional Military Education (JPME), and performance.

b. Marital Status and Number of Dependents Variables

The marital status variable (i.e., *married*) is a binary variable that defines whether a SWO is married (i.e., *married* = 1 if a SWO is married; and *married* = 0 if a SWO is single). Additionally, the number of dependents variable (i.e., *dependents*) is a continuous variable that specifies the number of documented dependents that the officer supports. Primarily, dependents include spouse and children, though other family members who are supported by the SWO can be claimed as dependents for pay and tax purposes.

c. Prior-enlisted Experience

The prior-enlisted experience variable (i.e., *prienlist*) is a binary variable, which determines if an officer spent at least four years of active duty service in the

enlisted ranks. As depicted in Appendix A, prior-enlisted status is influential in calculating basic pay, since the officer's rank is designated with an "E" suffix if the officer is prior enlisted (e.g., O-1E, O-2E, and O-3E). This categorically guarantees slightly higher basic pay than non-prior enlisted cohort counterparts. Additionally, prior-enlisted experience is a proxy for military-specific (and possibly general) training at the time of commissioning, since enlisted service includes basic military training and other technical training contingent on previous enlisted specialty.

d. Gender

Since gender is categorical, Table 18 defines the two dichotomous gender variables: *male* and *female*.

Table 18. Description of Gender Variables

Gender	Variable Name	Description
Male	<i>male</i>	= 1 if male = 0 if female
Female	<i>female</i>	= 1 if female = 0 if male

e. Race and Ethnicity Variables

Because the DMDC coding used for race and ethnicity variables changed over time, race and race/ethnicity were combined to more concisely classify SWOs' race and ethnicity into easy-to-understand categories. Although Hispanic is an ethnicity and not a race, officers who are Hispanic are classified as such in the respective race and ethnicity variable. Table 19 provides a description of the race and ethnicity variables used in this study, including: *amerindian*, *black*, *asian*, *white*, *hispanic*, and *other*.

Table 19. Description of Race and Ethnicity Variables

Race/Ethnicity	Variable Name	Description
American Indian/ Native Alaskan	<i>amerindian</i>	= 1 if American Indian or Alaskan native = 0 if another race/ethnicity
African American	<i>black</i>	= 1 if African American, not Hispanic = 0 if another race/ethnicity
Asian/Pacific Islander	<i>asian</i>	= 1 if Asian or Pacific islander = 0 if another race/ethnicity
Caucasian	<i>white</i>	= 1 if Caucasian, not Hispanic = 0 if another race/ethnicity
Hispanic	<i>hispanic</i>	= 1 if Hispanic = 0 if another race/ethnicity
Other	<i>other</i>	= 1 if race/ethnicity is classified as “other” = 0 if race/ethnicity is defined

f. Education Variables

The level of education acts as a proxy for the general training and education portion of SWOs’ human capital. Most commissioning programs require that an officer possess at least a bachelor’s degree prior to accession; however, there are no higher educational requirements in the surface warfare community. Therefore, officers possessing advanced degrees represent higher ability and higher motivation for those officers who strive to exceed minimum educational requirements in the SWO community. Promotion boards realize the value added by higher education and normally view obtaining a graduate degree as a positive indicator of higher-quality officers. Table 20 illustrates the dichotomous education-level categories (i.e., *bach*, *masters*, and *postmasters*) for the SWO sample.

Table 20. Description of Education-level Variables

Education Level	Variable Name	Description
Bachelor's Degree	<i>bach</i>	= 1 if highest education level achieved is a bachelor's degree = 0 if higher education
Master's Degree	<i>masters</i>	= 1 if highest education level achieved is a master's degree = 0 if (<i>bach</i> = 1 or <i>postmasters</i> = 1)
Post-Master's Degree, Professional Degree, or PhD	<i>postmasters</i>	= 1 if highest education level achieved is a post-master's degree, a professional degree, or PhD = 0 if lower education than post-master's degree

g. Joint Professional Military Education (JPME)

Just as graduate education implies higher quality in the officer corps, completing Joint Professional Military Education (JPME) also suggests high motivation and a higher level of military-specific (joint service) human capital that is significantly valued by the Navy (Office of the Secretary of Defense, 2007). Table 21 shows the binary JPME categories, including *JPMEph1* and *JPMEph2*.

Table 21. Description of Joint Professional Military Education (JPME) Variables

JPME Level	Variable Name	Description
JPME Phase I	<i>JPMEph1</i>	= 1 if completed JPME Phase I, but not JPME Phase II = 0 if not completed JPME Phase I or completed JPME Phase II
JPME Phase II	<i>JPMEph2</i>	= 1 if completed JPME Phase II (and JPME Phase I) = 0 if not completed JPME Phase II

h. Commissioning Source Variables

Officers' accession points, or ports of entry, are defined by their commissioning sources (Rosen, 1992, p. 227; Asch & Warner, 2001). Table 22 provides a description of the binary commissioning source variables: *academy*, *ROTC*, *OCS*, and *othercomm*.

Table 22. Description of Commissioning Source Variables

Commissioning Source	Variable Name	Description
United States Naval Academy (USNA)	<i>academy</i>	= 1 if commissioned through USNA = 0 if another commissioning source
Navy Reserve Officer Training Corps (NROTC)	<i>ROTC</i>	= 1 if commissioned through NROTC = 0 if another commissioning source
Officer Candidate School (OCS)	<i>OCS</i>	= 1 if commissioned through OCS = 0 if another commissioning source
Other Commissioning Sources	<i>othercomm</i>	= 1 if commissioned through the Aviation Cadet Program, Direct Appointment (DA) Program, Aviation Training Program, or “other” commissioning sources = 0 if (<i>academy</i> = 1 or <i>ROTC</i> = 1 or <i>OCS</i> = 1)

The portion of the SWO sample that graduated from the United States Naval Academy (USNA) was not used in this study, since promotions (based on lineal numbers) are systematically different for USNA graduates and depend mostly on internal institutional rigidities rather than performance (Chief of Naval Operations, 2005a).

i. Command Status

The command status variable (i.e., *command*) is a dichotomous variable, which indicates if an officer is in command of a military unit or has previously held unit command (i.e., *command* = 1 if currently in command or previously commanded a unit; and *command* = 0 if never commanded a military unit). Since holding a command position is highly desirable in the SWO community and requires a rigorous screening process, *command* is an indication of high ability and high quality. Most Surface Warfare Officers do not have the opportunity to assume command until approximately 9.5 YCS for Lieutenant Commander Command and 15 YCS for Commander Command (Commander Naval Surface Forces, 2008b). However, limited command opportunities also exist at more junior levels, such as command of a Navy reserve center (i.e., Navy Operational Support Centers).

j. Cash Compensation

The annual SWO cash compensation variable (i.e., *pay*) is a continuous variable that was calculated by adding the yearly sum of basic pay (i.e., *basicpay*), the annual total of other pays (i.e., *otherpay*), the annual aggregate of allowances (i.e., *allowance*), and the yearly total of bonuses (i.e., *bonus*). As time-series data, each continuous variable has a value for each of the 20 years (e.g., *pay2006*, *pay2005*, etc.). Pay variables for SWOs, who were not on active duty during a particular year, were coded zero to eliminate any missing values for pay across the 20-year cross-section of cohort data. Additionally, the logarithmic forms of these continuous independent variables were used for ease of interpreting the pay elasticity for each variable. Table 23 provides a detailed description of the cash compensation variables.

Table 23. Description of Cash Compensation (Pay) Variables

Pay Variable	Variable Name	Description
Total Pay	<i>pay</i>	= Total annual cash compensation = basic pay + other pays + allowances + bonuses
Log(Total Pay)	<i>lpay</i>	= Log(Total annual cash compensation) = Log(basic pay + other pays + allowances + bonuses)
Basic Pay	<i>basicpay</i>	= Annual basic pay received = (monthly basic pay × 12)
Log(Basic Pay)	<i>lbasicpay</i>	= Log(Annual basic pay received) = Log(monthly basic pay × 12)
Other Pays	<i>otherpay</i>	= Annual total of other pays (e.g., hardship duty pay, career sea pay, hostile fire and imminent danger pay, diving duty pay, foreign language proficiency pay, etc.) = (total monthly other pays × 12)
Log(Other Pays)	<i>lotherpay</i>	= Log(annual total of other pays) = Log(total monthly other pays × 12)
Allowances	<i>allowance</i>	= Annual total allowances (e.g., Basic Allowance for Housing, Basic Allowance for Subsistence, Family Separation Allowance, Cost of Living Allowance, etc.) = (total monthly allowances × 12)
Log(Allowances)	<i>lallowance</i>	= Log(annual total allowances) = Log(total monthly allowances × 12)
Bonuses	<i>bonus</i>	= Annual total bonus payments (e.g., bonus payments for the Nuclear Career Accession Bonus, Junior SWO CSRB, SWOCP, SWO Critical Skills Bonus, Senior SWO CSRB, etc.)
Log(Bonuses)	<i>lbonus</i>	= Log(annual total bonus payments)

D. METHODOLOGY

To evaluate the effectiveness of adding a performance-based compensation component to SWO retention bonuses, aspects of the current SWO community were first analyzed. First, differences in partial effects of the performance tiers on 13-year retention yielded relative probabilities of retention. Second, performance-tier characteristics econometric models revealed which quality characteristics increased or decreased the probability of a SWO being in a particular performance tier. Third, using a panel form of the dataset, pay elasticity models yielded specific pay elasticities for each

performance tier, thereby determining the retention effect of increasing or decreasing cash compensation. Finally, using the partial effects of performance tiers on 13-year retention and performance-tier pay elasticities, optimization models predicted the retention and cost effect of adding a performance-based compensation component to the SWO Critical Skills Bonus.

1. Econometric Models

For each econometric model, three separate regression techniques were performed:

1. Linear probability model (LPM) with robust standard errors
2. Univariate probit regression model
3. Calculations of the partial effects of the explanatory variables from the univariate probit regression model (“dprobit”)

Employing ordinary least squared (OLS) estimation, the linear probability model (LPM) with robust standard errors yielded partial effects of each independent variable. However, the LPM has several drawbacks as an estimation technique for dealing with a binary dependent variable. Foremost, predicted values are not confined to the normal probability range from zero to one (Wooldridge, 2006). According to Wooldridge (2006), intrinsic heteroskedasticity is caused by the inconsistent variance of the error term due to the distribution of the independent variable. Furthermore, the partial effects of independent variables are constant in a linear probability model, which could yield different results depending on their relative weights for each prediction (Wooldridge, 2006).

Due to the drawbacks of LPMs given the binary dependent variables, probit models (with corresponding partial effects estimations) provided more accurate estimations. As discussed by Wooldridge (2006), the function used in the probit model was the standard normal cumulative distribution function, represented by the following equation:

$$G(z) = \Phi(z) = \int_{-\infty}^z \phi(v)dv$$

where $\phi(z)$ is the standard normal density, represented by:

$$\phi(z) = (2\pi)^{-1/2} \exp\left(-\frac{z^2}{2}\right) \quad (\text{p. 584}).$$

Using maximum likelihood estimation (MLE), conditional on the explanatory variables, this study estimated the partial effects of each independent variable using partial derivatives. The statistics and data analysis computer program, STATA, calculated these partial effects using the dprobit function (Wooldridge, 2006).

a. Model for 13-year Retention

The first regression model analyzed the difference in the partial effects of performance tiers on 13-year retention. The 13-year port of exit was selected to address the shortage of SWOs, which is prominent in the midgrade officer ranks and coincides with the SWO Critical Skills Bonus. The following model specification was used in this study:

$$\begin{aligned} \text{Pr}(\text{retention13yr}) = & \beta_0 + \beta_1(\text{age}) + \beta_2(\text{dependents}) + \beta_3(\text{prienlist}) + \beta_4(\text{female}) \\ & + \beta_5(\text{amerindian}) + \beta_6(\text{asian}) + \beta_7(\text{black}) + \beta_8(\text{hispanic}) \\ & + \beta_9(\text{other}) + \beta_{10}(\text{married}) + \beta_{11}(\text{masters}) + \beta_{12}(\text{postmasters}) \\ & + \beta_{13}(\text{JPMEph1}) + \beta_{14}(\text{JPMEph2}) + \beta_{15}(\text{OCS}) + \beta_{16}(\text{othercomm}) \\ & + \beta_{17}(\text{command}) + \beta_{18}(\text{tier2perform}) + \beta_{19}(\text{tier3perform}) + e_i \end{aligned}$$

Due to perfect collinearity among other categorical variables, *male*, *white*, *bach*, *ROTC*, and *tier1perform* were excluded from the regression model. Additionally, pay variables were not included in the model specification, since pay and performance tiers may be correlated due to faster promotion directly, causing an increase in cash compensation, which would lead to severe model bias. The probability of retention through 13-years of commissioned service, $\text{Pr}(\text{retention13yr})$, is the z in the cumulative

distribution function of the probit model. The coefficients of the explanatory variables in the dprobit model yield the partial effects of the β s from the probit regression model.

b. Models for Tier Characteristics

Toward classifying which indicators of quality best predict assignment to a particular performance tier, econometric models were developed to predict the probability of being categorized as tier-1, tier-2, and tier-3 performers. These regressions determine the validity of the performance proxies, which are based on time to promotion to O-4. The model specification for tier-1 performers is as follows:

$$\begin{aligned} \text{Pr}(\text{tier1perform}) = & \beta_0 + \beta_1(\text{age}) + \beta_2(\text{dependents}) + \beta_3(\text{prienlist}) + \beta_4(\text{female}) \\ & + \beta_5(\text{amerindian}) + \beta_6(\text{asian}) + \beta_7(\text{black}) + \beta_8(\text{hispanic}) \\ & + \beta_9(\text{other}) + \beta_{10}(\text{married}) + \beta_{11}(\text{masters}) + \beta_{12}(\text{postmasters}) \\ & + \beta_{13}(\text{JPMEph1}) + \beta_{14}(\text{JPMEph2}) + \beta_{15}(\text{OCS}) + \beta_{16}(\text{othercomm}) \\ & + \beta_{17}(\text{command}) + e_i \end{aligned}$$

$\text{Pr}(\text{tier1perform})$ is the z in the cumulative distribution function for the probit model; therefore, the dprobit model predicts the partial effects of the independent variables on the probability of being a tier-1 performer. Similar regression models were developed using *tier2perform* and *tier3perform* as binary dependent variables to gather insight into the quality characteristics that define each performance tier.

c. Models for Pay Elasticity

Calculating the elasticity of pay by performance tier was a critical step in evaluating the effectiveness of adding a performance-based compensation component to SWO retention bonuses. Since pay varies by year and an overall pay elasticity for each performance tier is needed for the optimization models, the dataset was transformed from time-series to panel-data form. This process creates 20 observations (or records) for each individual SWO, one for each year of cohort data. The following is the model specification for the pay elasticity models:

$$\begin{aligned}
\text{Pr}(\text{retention13yr}) = & \beta_0 + \beta_1(\text{age}) + \beta_2(\text{dependents}) + \beta_3(\text{prienlist}) + \beta_4(\text{female}) \\
& + \beta_5(\text{amerindian}) + \beta_6(\text{asian}) + \beta_7(\text{black}) + \beta_8(\text{hispanic}) \\
& + \beta_9(\text{other}) + \beta_{10}(\text{married}) + \beta_{11}(\text{masters}) + \beta_{12}(\text{postmasters}) \\
& + \beta_{13}(\text{JPMEph1}) + \beta_{14}(\text{JPMEph2}) + \beta_{15}(\text{OCS}) + \beta_{16}(\text{othercomm}) \\
& + \beta_{17}(\text{command}) + \beta_{18}\log(\text{pay}) + \beta_{19}(\text{YEARdummies}) + e_i
\end{aligned}$$

Separate models were estimated for the sub-samples representing each performance tier, so that the pay elasticity (i.e., the partial effects of $\log(\text{pay})$) for each tier could be predicted, holding all other independent variables constant. Additionally, year dummy variables (i.e., YEARdummies) were included in the panel data models to control for differences in pay across time, such as inflation or systematic military basic pay increases. Similar to the time-series retention models, $\text{Pr}(\text{retention13yr})$ is the z in the cumulative distribution function for the probit model. The dprobit model yielded the partial effects of the β s on the probability of retention through 13 YCS for each performance tier.

2. Optimization Models

Based on performance-based compensation theory, a more optimal method is predicted for allocating the SWO Critical Skills Bonus to retain a higher quality SWO workforce, while still remaining within a fixed budget. Payment of different bonus amounts to each performance tier will create a performance-based component of the bonus program, which rewards higher performing SWOs with higher bonus payments. To create the optimization models, it is assumed that all SWOs retaining through 13 YCS accept the 3-year obligation option for the SWO Critical Skills Bonus. If a SWO intends to retain to 13 YCS (completing the first year of a three-year obligation of the SWO Critical Skills Bonus), accepting the monetary portion of the bonus is only logical. Based on this assumption, the composition of the retained SWO community can be adjusted through optimization models by using two objective functions:

1. Maximize 13-year SWO retention
2. Maximize retention bonus differential between performance tiers.

However, the first step to developing optimization models involves calculating the present value of the SWO Critical Skills Bonus. All financial computations and optimization models were developed using Microsoft Excel's Solver component.

a. Present Value of the SWO Critical Skills Bonus

According to the Office of Management and Budget (OMB) *Circular A-94* (1992), the federal government uses a 7-percent discount rate for net present value calculations. Therefore, based on the current payment scheme of the SWO Critical Skills Bonus for a 3-year obligation, present value (PV) calculations for the \$46,000 total payment are illustrated in Table 24.

Table 24. Present Value (PV) Calculation for the 3-year Obligation Option of the SWO Critical Skills Bonus

Payment Year	Time (in Yrs)	Payment	PV of Payment
LCDR+2	0	\$22,000.00	\$22,000.00
LCDR+3	1	\$12,000.00	\$11,214.95
LCDR+4	2	\$12,000.00	\$10,481.26
Totals:		\$46,000.00	\$43,696.22

Based on these calculations, the net present value (NPV) for the 3-year obligation option of the SWO Critical Skills Bonus is \$43,696.22.

b. Maximizing 13-year Retention

To optimize the SWO Critical Skills Bonus program, the number of SWOs retaining through 13 YCS is maximized through the first optimization model. The decision variables are:

- *Tier1*—the number of tier-1 performers retained
- *Tier2*—the number of tier-2 performers retained
- *Tier3*—the number of tier-3 performers retained
- *P1*—the NPV of the retention bonus for tier-1 performers
- *P2*—the NPV of the retention bonus for tier-2 performers
- *P3*—the NPV of the retention bonus for tier-3 performers

The objective function is to maximize total SWO 13-year retention (i.e., MAXIMIZE $Total\ Retention = Tier1 + Tier2 + Tier3$), subject to the constraints contained in Table 25.

Table 25. 13-year Retention Optimization Model Constraints and Definitions

Constraints	Constraint Equations
Total Budget	$(Tier1 * P1) + (Tier2 * P2) + (Tier3 * P3) \leq Total\ Budget$
Bonus Hierarchy	$P1 - P2 \geq 0, P2 - P3 \geq 0$ (i.e., $P1 > P2 > P3$)
Retention Probability of Tier 1	$Pr(Tier1) \leq 1, Pr(Tier1) \geq 0$
Retention Probability of Tier 2	$Pr(Tier2) \leq 1, Pr(Tier2) \geq 0$
Retention Probability of Tier 3	$Pr(Tier3) \leq 1, Pr(Tier3) \geq 0$
$P1$ Retention Bonus Constraint	$P1 \geq P_{old}$
Tier-1 Available Pool of LCDRs	$Tier1 \leq (Tier1Available)$
Tier-2 Available Pool of LCDRs	$Tier2 \leq (Tier2Available)$
Tier-3 Available Pool of LCDRs	$Tier3 \leq (Tier3Available)$
$Tier1$ Definition Constraint	$Tier1 = (Tier1Available) * \left(Pr(Tier1Retention) + \left(\mathcal{E}_{Tier1} * \frac{100(P1 - P_{old})}{P_{old}} \right) \right)$
$Tier2$ Definition Constraint	$Tier2 = (Tier2Available) * \left(Pr(Tier2Retention) + \left(\mathcal{E}_{Tier2} * \frac{100(P2 - P_{old})}{P_{old}} \right) \right)$
$Tier3$ Definition Constraint	$Tier3 = (Tier3Available) * \left(Pr(Tier3Retention) + \left(\mathcal{E}_{Tier3} * \frac{100(P3 - P_{old})}{P_{old}} \right) \right)$
Non-negativity Constraints	$P1, P2, P3, Tier1, Tier2, Tier3 \geq 0$
Integer Constraints	$Tier1, Tier2, Tier3$ must be integers

Definitions: *Tier1Available* = Number of tier-1 performers promoted to LCDR
Tier2Available = Number of tier-2 performers promoted to LCDR
Tier3Available = Number of tier-3 performers promoted to LCDR
Tier1Retention = Probability of 13-year retention for tier 1
Tier2Retention = Probability of 13-year retention for tier 2
Tier3Retention = Probability of 13-year retention for tier 3
 $\mathcal{E}_{\text{Tier1}}$ = Pay elasticity of tier-1 performers
 $\mathcal{E}_{\text{Tier2}}$ = Pay elasticity of tier-2 performers
 $\mathcal{E}_{\text{Tier3}}$ = Pay elasticity of tier-3 performers
 P_{old} = NPV of current SWO Critical Skills Bonus (\$43,696.22)

The budget constraint ensures that the proposed performance-based component of the SWO Critical Skills Bonus does not cost the Navy any more than the current program. The bonus hierarchy constraints create the performance-based component of the bonus structure. In other words, tier-1 performers are paid higher than tier-2 performers, and tier-2 performers are paid more than tier-3 performers. The retention probability constraints guarantee that the retention probabilities for each performance tier will remain in the normal probability range between 0 and 1, when the probabilities are adjusted for the elasticity of pay as the bonus payment scheme changes. Though not a binding constraint, the *PI* retention bonus constraint secures a higher bonus payout for tier-1 performers than the current SWO Critical Skills Bonus permits. The “available pool” constraints ensure that number of retained SWOs through 13 YCS does not exceed the number of available Lieutenant Commanders.

The tier definition constraints use the retention probabilities and pay elasticities derived from the probit regression models for each performance tier. For each tier, the baseline probability of retention through 13 YCS is modified by the product of the pay elasticity and the percent change in the bonus payment. Holding performance tier constant, this modified 13-year retention probability is applied to the number of available Lieutenant Commanders to yield the actual number of retained SWOs. This methodology ensures that the optimization model results conform to the empirical findings from the econometric models.

Finally, to produce realistic results for the decision variables, the number of SWOs in each performance tier must be positive and integers. Additionally, the

resulting bonus payments for each performance tier must be positive. Negative bonus payments would imply that the Navy is punishing officers for retaining by withholding basic pay.

c. Maximizing the Retention Bonus Differential between Performance Tiers

The second optimization model builds upon the results of the first optimization model that maximizes 13-year retention. Since all constraints in the first optimization model are not necessarily binding, the second model adjusts the performance tier composition of the retained SWO population. This optimization model maximizes the retention bonus differential between performance tiers, while constraining the total number of retained SWOs. Tournament theory suggests this pay differential between levels will elicit more effort from SWOs. Therefore, the Navy should provide greater compensation to higher performers, encouraging a higher level of performance. (Lazear & Rosen, 1981)

The decision variables remain the same for both optimization models. However, the objective function of the second model is to maximize the bonus differential between performance tiers (i.e., $\text{MAXIMIZE } (P1-P2) + (P1-P3)$). The same constraints apply for both optimization models; however, the bonus differential model adds a constraint for 13-year SWO retention to maintain the same retention rate as the first optimization model.

E. HYPOTHESIZED EFFECTS OF EXPLANATORY VARIABLES

The following provides a summary of the three hypothesized effects of significant explanatory variables in this study:

- The relationship between performance and SWO retention will be “curvilinear,” where tier-1 performers and tier-3 performers have lower probabilities of retention than tier-2 performers.
- Quality variables (e.g., graduate education, JPME, and command status) will have a positive effect on the probability of classification as a tier-1 performer and a negative effect on the probability of being a tier-3 performer.

- Pay elasticity will be higher for tier-1 performers than for their lower performing counterparts, tier-2 performers and tier-3 performers.

1. “Curvilinear” Relationship between Performance and Retention

Studying employee data in a large civilian firm, Trevor et al. (1997) found a “curvilinear” relationship between performance and employee retention, such that high performing employees and low performing employees had much lower survival probabilities than average performers (p. 45). Additionally, Gibbs (2006) discovered that the highest performing China Lake employees (in Grades 3 and 4) had higher probabilities of leaving the organization than average- and lower-performing employees. Therefore, it is hypothesized that SWO retention will display a “curvilinear” relationship with performance tiers. Tier-1 performers are predicted to have lower probabilities of retention than tier-2 performers, and tier-3 performers are also predicted to have lower probabilities of retention than tier-2 performers. Furthermore, tier-1 performers are expected to have slightly higher retention rates than tier-3 performers, since poor performance in the Navy is unrewarded. Internal labor market forces are estimated to push poor performers out of the organization at a higher rate than external market forces (i.e., civilian job opportunities) pull high performers from the Navy (Sturman et al., 2003).

2. Effect of Quality Variables on Performance Tiers

Based on the assumption that promotion is a viable proxy for performance in the SWO community, the tiered performance categories were developed using time-to-promote to Lieutenant Commander. O-4 promotion boards positively favor measures of high quality, motivation, and performance, such as: graduate education, completion of JPME Phases I and II, and command opportunity (Asch & Warner, 2001; Secretary of the Navy, 2007b). These measures are expected to have a positive effect on the probability of classification as a tier-1 performer and a negative effect on the probability of being categorized a tier-3 performer.

3. Pay Elasticity Differences between Performance Tiers

Higher performers may receive more motivation from intrinsic sources (e.g., patriotism, leadership opportunities, and job security) rather than extrinsic sources (e.g., higher pay) (Norman, 1971; Strickler, 2006). This would suggest lower pay elasticity for higher performers compared to average or lower performers. However, Lazear (1989) argues that similar pay for both high performers and low performers leads to dissatisfaction and a higher propensity to leave the organization. Since high-performing and higher-quality SWOs generally have more military-specific and general human capital, they are more likely to have better-paying job offers in the civilian sector (Rosen, 1992; Baker et al., 1994a; Gibbons & Waldman, 1999b). If these SWOs leave at a higher rate than their lower performing counterparts based on perceived pay inequity, then increasing military pay is expected to close the civilian-military pay gap. Therefore, high-performing SWOs are hypothesized to have larger pay elasticities than their lower-performing peers. A tier-1 performer is predicted to have a higher pay elasticity than a tier-2 performer, and a tier-2 performer's pay elasticity is anticipated to be higher than a tier-3 performer's pay elasticity.

F. DESCRIPTIVE STATISTICS

1. Performance-tiered SWO Sample

The sample contains 1,331 Surface Warfare Officers who promoted to the rank of Lieutenant Commander (O-4) and were subsequently assigned into the three performance tiers. Table 26 presents descriptive statistics for the portion of the SWO sample categorized into performance tiers.

Table 26. Descriptive Statistics for the Performance-tiered SWO Sample

Variable	# of Obs.	Mean	Standard Deviation
<i>age</i>	1331	24.4688	2.9217
<i>dependents</i>	1331	2.2675	1.4875
<i>prienlist</i>	1331	0.2449	0.4302
<i>female</i>	1331	0.0406	0.1974
<i>amerindian</i>	1331	0.0053	0.0724
<i>asian</i>	1331	0.0323	0.1769
<i>black</i>	1331	0.1074	0.3098
<i>hispanic</i>	1331	0.0631	0.2433
<i>other</i>	1331	0.0098	0.0984
<i>white</i>	1331	0.7821	0.4130
<i>married</i>	1331	0.8272	0.3782
<i>bach</i>	1331	0.7288	0.4448
<i>masters</i>	1331	0.2622	0.4400
<i>postmasters</i>	1331	0.0090	0.0946
<i>JPMEph1</i>	1331	0.0233	0.1509
<i>JPMEph2</i>	1331	0.0128	0.1123
<i>OCS</i>	1331	0.2757	0.4471
<i>othercomm</i>	1331	0.0676	0.2512
<i>ROTC</i>	1331	0.6566	0.4750
<i>command</i>	1331	0.0887	0.2844
<i>tier1perform</i>	1331	0.3516	0.4777
<i>tier2perform</i>	1331	0.5973	0.4906
<i>tier3perform</i>	1331	0.0511	0.2203
<i>retention13yr</i>	902	0.7506	0.4329

As a proxy for maturity level, the continuous variable *age* has a mean of 24.5 years, with a 2.9-year standard deviation. Based on the prior-enlisted variable, 24.5 percent of the sample spent at least 4 years as prior enlisted service members. Few SWOs possessed the quality characteristics desired by promotion boards, such as *masters*, *postmasters*, *JPMEph1*, *JPMEph2*, and *command*. Of the entire performance-tiered sample, 26.22 percent possess master's degrees, 0.9 percent possess at least a post-master's degree, 2.33 percent have completed JPME Phase I, 1.28 percent have completed JPME Phase II, and 8.87 percent have held command. The performance tiers (i.e., *tier1perform*, *tier2perform*, and *tier3perform*) establish the performance cutoffs used in the econometric and optimization models. The sample distribution is as follows:

35.16 percent are tier-1 performers, 59.73 percent are tier-2 performers, and 5.11 percent are tier-3 performers. Based on the sample mean, the 13-year retention rate is 75.06 percent, which reflects a conditional probability dependent on promotion to O-4. Therefore, this 13-year retention rate is conditional on retention through at least 9 YCS.

The mean of the 13-year retention variable is calculated from fewer observations than for other variables (i.e., 902 compared to 1,331 observations). Some SWOs may stay beyond 13 YCS; however, due to the DMDC dataset not continuing beyond December 2006, the data is not mature enough to capture service to 13 YCS for newly minted Lieutenant Commanders. For example, SWOs who promoted to O-4 in 2004 or later and have only served between 9 YCS and 10 YCS do not have the opportunity to impact the 13-year retention rate. This delta in the number observations is observable in the following tables as well.

2. Characteristics of Each Performance Tier

To establish three performance tiers, the sample is divided by time to promote to O-4. Table 27 displays the time to promote to O-4 for the three tiers.

Table 27. Descriptive Statistics for Time to Promote to O-4 by Performance Tier

Performance Category	# of Obs.	Time to Promote to O-4 (in days)			
		Mean	Standard Deviation	Min	Max
<i>tier1perform</i>	468	3525.553	99.5432	3287	3652
<i>tier2perform</i>	795	3756.122	79.3995	3653	4013
<i>tier3perform</i>	68	4174.441	96.5801	4020	4369

The mean number of days to promote in the tier-1 performance category is 3,526 days, or approximately 9.66 years. The promotion window for tier-1 performers indicates officers who are on the “fast track” and correspond to officers promoted “below zone,” thereby promoting in the least amount of time (i.e., between 9 YCS and 10 YCS). Tier-2 performers promote between 10 YCS and 11 YCS, and they represent “in zone”

promotions, while tier-3 performers promote the slowest (i.e., between 11 and 12 YCS), corresponding to the “below zone” promotion category. (Secretary of the Navy, 2006, pp. 8-9)

Table 28, Table 29, and Table 30 display descriptive statistics for tier-1, tier-2, and tier-3 performers, respectively.

Table 28. Descriptive Statistics for Tier-1 Performers

Variable	# of Obs.	Mean	Standard Deviation
<i>age</i>	468	25.1987	3.0746
<i>dependents</i>	468	2.3419	1.5578
<i>prienlist</i>	468	0.3568	0.4796
<i>female</i>	468	0.0470	0.2119
<i>amerindian</i>	468	0.0085	0.0922
<i>asian</i>	468	0.0214	0.1448
<i>black</i>	468	0.0962	0.2951
<i>hispanic</i>	468	0.0641	0.2452
<i>other</i>	468	0.0000	0.0000
<i>white</i>	468	0.8098	0.3929
<i>married</i>	468	0.8483	0.3591
<i>bach</i>	468	0.7585	0.4284
<i>masters</i>	468	0.2286	0.4204
<i>postmasters</i>	468	0.0128	0.1126
<i>JPMEph1</i>	468	0.0150	0.1215
<i>JPMEph2</i>	468	0.0021	0.0462
<i>OCS</i>	468	0.4017	0.4908
<i>othercomm</i>	468	0.0940	0.2922
<i>ROTC</i>	468	0.5043	0.5005
<i>command</i>	468	0.0684	0.2527
<i>retention13yr</i>	155	0.8452	0.3629

Table 29. Descriptive Statistics for Tier-2 Performers

Variable	# of Obs.	Mean	Standard Deviation
<i>age</i>	795	24.1333	2.8038
<i>dependents</i>	795	2.3006	1.4577
<i>prienlist</i>	795	0.1899	0.3925
<i>female</i>	795	0.0327	0.1780
<i>amerindian</i>	795	0.0038	0.0614
<i>asian</i>	795	0.0377	0.1907
<i>black</i>	795	0.1119	0.3155
<i>hispanic</i>	795	0.0642	0.2452
<i>other</i>	795	0.0138	0.1169
<i>white</i>	795	0.7686	0.4220
<i>married</i>	795	0.8340	0.3723
<i>bach</i>	795	0.6918	0.4620
<i>masters</i>	795	0.3006	0.4588
<i>postmasters</i>	795	0.0075	0.0866
<i>JPMEph1</i>	795	0.0302	0.1712
<i>JPMEph2</i>	795	0.0201	0.1405
<i>OCS</i>	795	0.2038	0.4031
<i>othercomm</i>	795	0.0553	0.2288
<i>ROTC</i>	795	0.7409	0.4384
<i>command</i>	795	0.1082	0.3108
<i>retention13yr</i>	686	0.7741	0.4185

Table 30. Descriptive Statistics for Tier-3 Performers

Variable	# of Obs.	Mean	Standard Deviation
<i>age</i>	68	23.3677	2.0289
<i>dependents</i>	68	1.3676	0.9759
<i>prienlist</i>	68	0.1176	0.3246
<i>female</i>	68	0.0882	0.2857
<i>amerindian</i>	68	0.0000	0.0000
<i>asian</i>	68	0.0441	0.2069
<i>black</i>	68	0.1324	0.3414
<i>hispanic</i>	68	0.0441	0.2069
<i>other</i>	68	0.0294	0.1702
<i>white</i>	68	0.7500	0.4362
<i>married</i>	68	0.6029	0.4929
<i>bach</i>	68	0.9559	0.2069
<i>masters</i>	68	0.0441	0.2069
<i>postmasters</i>	68	0.0000	0.0000
<i>JPMEph1</i>	68	0.0000	0.0000
<i>JPMEph2</i>	68	0.0000	0.0000
<i>OCS</i>	68	0.2500	0.4362
<i>othercomm</i>	68	0.0294	0.1702
<i>ROTC</i>	68	0.7206	0.4520
<i>command</i>	68	0.0000	0.0000
<i>retention13yr</i>	61	0.2459	0.4342

Demographic characteristics vary among performance tiers. A continuous variable, *age*, represents maturity at accession. Tier-1 performers exhibit the greatest maturity at accession, with an average age of 25.2 years. When compared to tier-1 performers, accession age decreases among tier-2 performers with a mean age of 24.1 years, and the maturity level further decreases among tier-3 performers at an average accession age of 23.4 years. However, the number of dependents supported by Surface Warfare Officers is relatively constant among tiers. Tier-1 and tier-2 performers support the largest number of dependents (similar means of 2.3 dependents), while tier-3 performers support a smaller number of dependents (a mean of 1.4 dependents). By gender, 4.7 percent of tier-1 performers, 3.3 percent of tier-2 performers, and 8.8 percent of tier-3 performers are female. On average, tier-1 and tier-2 performers exhibit nearly the same marital status, while tier-3 performers have a significantly lower marriage rate.

In examining the prior-enlisted effect, 35.7 percent of tier-1 performers, 19.0 percent of tier-2 performers, and only 11.8 percent of tier-3 performers have at least 4 years of prior-enlisted experience. This implies that prior-enlisted experience may translate to other observable characteristics that make a SWO more desirable to the O-4 promotion board. Since prior-enlisted experience is an investment in military-specific training, the level of human capital may be elevated among SWOs who once wore blue-shirts and dungarees.

Tier-1 and tier-2 performers have unexpected education group means. Nearly 23 percent of tier-1 performers have at least a master's degree, while approximately 30 percent of tier-2 performers have at least a master's degree. A stark difference from tier-1 and tier-2 performers, only 4.4 percent of the lower-quality, tier-3 SWOs have greater than a bachelor's degree. These observations indicate that the performance tiers are capturing performance.

Analyzing the 13-year retention rate, tier-1 performers exhibit the largest value to the SWO community and have the greatest mean retention rate of 84.52 percent. Tier-2 performers have a mean retention rate of 77.41 percent, and tier-3 performers retain at a dismal rate of 24.59 percent. The total number of observations for the *retention13yr* variable is smaller than the observations for other variables due to the maturity of the time series dataset. Figure 35 is a graphical representation of the mean retention rates for the three performance tiers.

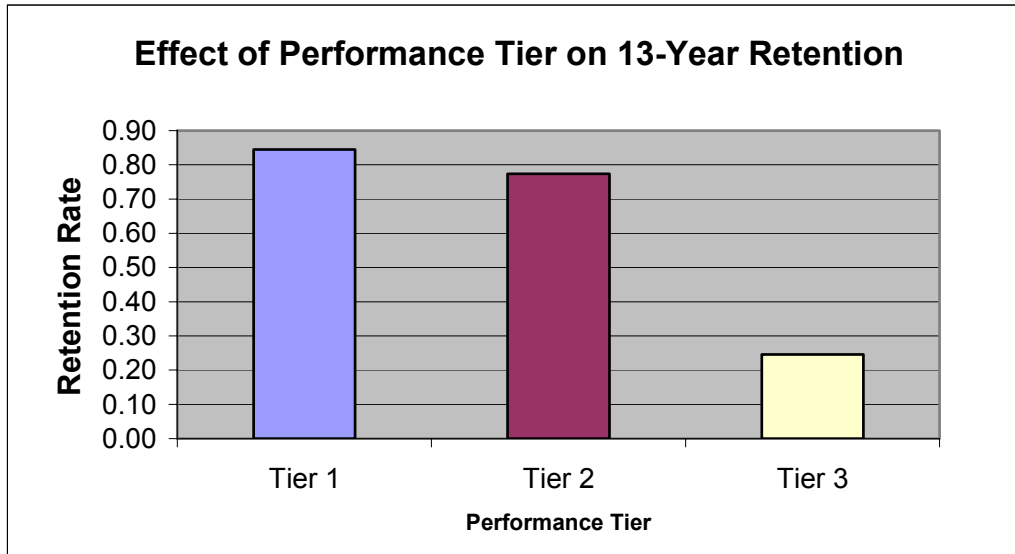


Figure 35. Effect of Performance Tier on 13-year Retention Based on Descriptive Statistics

Among the three performance tiers, Table 31 displays the t-test results for the difference in group means for the quality characteristics: master's degree, post-master's degree, JPME Phase I, JPME Phase II, and command status.

Table 31. T-test for Tier Differences in Group Means for Quality Characteristics

	# of Obs.	Mean	Standard Deviation	t-stat	df	P-value (2-tailed)
Master's Degree						
Tier-1 Performer	468	0.2286	0.4204	2.0526	1329	0.0403
Non-Tier-1	863	0.2804	0.4495			
Tier-2 Performer	795	0.3006	0.4588	-3.9003	1329	0.0001
Non-Tier-2	536	0.2052	0.4042			
Tier-3 Performer	68	0.0441	0.2069	4.2224	1329	0.0000
Non-Tier-3	1263	0.2740	0.4462			
Post-Master's Degree, Professional Degree, or PhD						
Tier-1 Performer	468	0.0128	0.1126	-1.0811	1329	0.2799
Non-Tier-1	863	0.0070	0.0831			
Tier-2 Performer	795	0.0075	0.0866	0.6899	1329	0.4904
Non-Tier-2	536	0.0112	0.1053			
Tier-3 Performer	68	0.0000	0.0000	0.8070	1329	0.4198
Non-Tier-3	1263	0.0095	0.0970			
JPME Phase I						
Tier-1 Performer	468	0.0150	0.1215	1.4845	1329	0.1379
Non-Tier-1	863	0.0278	0.1645			
Tier-2 Performer	795	0.0302	0.1712	-2.0337	1329	0.0422
Non-Tier-2	536	0.0131	0.1136			
Tier-3 Performer	68	0.0000	0.0000	1.3071	1329	0.1914
Non-Tier-3	1263	0.0245	0.1548			
JPME Phase II						
Tier-1 Performer	468	0.0021	0.0462	2.5489	1329	0.0109
Non-Tier-1	863	0.0185	0.1350			
Tier-2 Performer	795	0.0201	0.1405	-2.9167	1329	0.0036
Non-Tier-2	536	0.0019	0.0432			
Tier-3 Performer	68	0.0000	0.0000	0.9625	1329	0.3360
Non-Tier-3	1263	0.0135	0.1153			
Command Status						
Tier-1 Performer	468	0.0684	0.2527	1.9179	1329	0.0553
Non-Tier-1	863	0.0997	0.2997			
Tier-2 Performer	795	0.1082	0.3108	-3.0598	1329	0.0023
Non-Tier-2	536	0.0597	0.2372			
Tier-3 Performer	68	0.0000	0.0000	2.6452	1329	0.0083
Non-Tier-3	1263	0.0934	0.2911			

In general, t-tests determine whether the group means between performance categories are statistically different from each other. Because these quality variables are binary, the differences are expressed in percentage points (ppts). The group mean for tier-1 performers is compared to the group mean of non-tier-1 performers, which includes both tier-2 performers and tier-3 performers. The group mean for tier-2 performers is compared to non-tier-2 performers (i.e., tier-1 performers and tier-3 performers), and the group mean for tier-3 performers is compared to non-tier-3 performers (i.e., tier-1 performers and tier-2 performers). The p-values from the t-tests determine the statistical significance of the difference in group means between the performance tiers. The following sections present the t-test results for each quality characteristic. (Wooldridge, 2006)

a. Master's Degree

Analyzing group means, 22.9 percent of tier-1 performers have a master's degree, while 28.0 percent of non-tier-1 performers earned a master's degree. Based on the t-test, this difference is statistically significant. Therefore, non-tier-1 performers are 5.1 percentage points more likely to have a master's degree than tier-1 performers. This result is counterintuitive, since tier-1 performers are expected to have a higher probability of earning a master's degree. This discrepancy may be attributable to the significantly higher probability that tier-2 performers will earn a master's degree. If tier-2 performers realize their mediocrity in on-the-job performance, then they may try to improve their service record by adding graduate education to their résumé.

Comparing tier-2 performers to non-tier-2 performers, tier-2 performers have a probability of earning a master's degree that is 9.5-ppts greater than non-tier-2 performers, which is statistically significant. Furthermore, non-tier-3 performers have a 23.0-ppt greater probability of acquiring a master's degree (which is statistically significant at the 1-percent level) compared to lower-performing, tier-3 performers.

b. Post-Master's Degree

Performing t-tests for differences in group means for the post-master's degree variable produced large p-values for all three performance tiers, which indicate that there is no statistical difference between the group means among the performance tiers. Therefore, the group mean for tier-1 performers of 1.3 percent is statistically no different than the 0.7 percent group mean for non-tier-1 performers. Similarly, there is no statistical difference between tier-2 performers and non-tier-2 performers, and between tier-3 performers and non-tier-3 performers.

c. JPME Phase I

Based on t-test results, only one tier had a statistically significant difference in group means: tier-2 performers. Statistically significant at the 5-percent level, tier-2 performers have a probability of completing JPME Phase I that is 1.7-ppts greater than non-tier-2 performers. Since this difference is relatively small, the effect may not be practically significant.

d. JPME Phase II

Testing the difference in group means for JPME Phase II proved statistically significant in two of the three performance tier comparisons. The probability that non-tier-1 performers will have JPME Phase II complete is 1.6-ppts greater than for tier-1 performers. Additionally, tier-2 performers have a probability of completing JPME Phase II that is 1.8-ppts larger than non-tier-2 performers.

e. Command Status

Testing the influence of command status (i.e., whether or not a SWO was selected to command a unit) between group means showed statistical significance among all three performance tiers. However, the difference between tier-1 performers and non-tier-1 performers was statistically significant at the 90-percent confidence level, while the other two were statistically significant at the 95-percent confidence level. Non-tier-1 performers have a probability of having held command that is 3.1-percentage points

greater than tier-1 performers, while tier-2 performers have a 4.9-ppt greater probability of being selected for command compared to non-tier-2 performers. Moreover, non-tier-3 performers have a probability of selection for command that is 9.3 ppts greater than tier-3 performers. Therefore, being a tier-2 performer increases the probability of having previously held or currently holding command, when compared to the other two performance tiers.

3. Gender Differences

Table 32 and Table 33 display descriptive statistics separated by gender. Both tables have a difference in observations between the 13-year retention variable and the other independent variables due to the aforementioned lack of data maturity. Particularly, 402 observations are lost in the male SWO sub-sample, while the female sub-sample loses 50-percent of its observations, from 54 reduced to only 27 observations.

Table 32. Descriptive Statistics for Male SWOs

Variable	# of Obs.	Mean	Standard Deviation
<i>age</i>	1277	24.4793	2.9284
<i>dependents</i>	1277	2.3195	1.4759
<i>prienlist</i>	1277	0.2459	0.4308
<i>amerindian</i>	1277	0.0055	0.0739
<i>asian</i>	1277	0.0305	0.1721
<i>black</i>	1277	0.1057	0.3076
<i>hispanic</i>	1277	0.0634	0.2438
<i>other</i>	1277	0.0102	0.1004
<i>white</i>	1277	0.7847	0.4112
<i>married</i>	1277	0.8395	0.3672
<i>bach</i>	1277	0.7283	0.4450
<i>masters</i>	1277	0.2631	0.4405
<i>postmasters</i>	1277	0.0086	0.0924
<i>JPMEph1</i>	1277	0.0235	0.1515
<i>JPMEph2</i>	1277	0.0125	0.1113
<i>OCS</i>	1277	0.2764	0.4474
<i>othercomm</i>	1277	0.0681	0.2521
<i>ROTC</i>	1277	0.6554	0.4754
<i>command</i>	1277	0.0893	0.2852
<i>tier1perform</i>	1277	0.3493	0.4769
<i>tier2perform</i>	1277	0.6022	0.4896
<i>tier3perform</i>	1277	0.0486	0.2150
<i>retention13yr</i>	875	0.7531	0.4314

Table 33. Descriptive Statistics for Female SWOs

Variable	# of Obs.	Mean	Standard Deviation
<i>age</i>	54	24.2222	2.7723
<i>dependents</i>	54	1.0370	1.2126
<i>prienlist</i>	54	0.2222	0.4196
<i>amerindian</i>	54	0.0000	0.0000
<i>asian</i>	54	0.0741	0.2644
<i>black</i>	54	0.1481	0.3586
<i>hispanic</i>	54	0.0556	0.2312
<i>other</i>	54	0.0000	0.0000
<i>white</i>	54	0.7222	0.4521
<i>married</i>	54	0.5370	0.5033
<i>bach</i>	54	0.7407	0.4423
<i>masters</i>	54	0.2407	0.4315
<i>postmasters</i>	54	0.0185	0.1361
<i>JPMEph1</i>	54	0.0185	0.1361
<i>JPMEph2</i>	54	0.0185	0.1361
<i>OCS</i>	54	0.2593	0.4423
<i>othercomm</i>	54	0.0556	0.2312
<i>ROTC</i>	54	0.6852	0.4688
<i>command</i>	54	0.0741	0.2644
<i>tier1perform</i>	54	0.4074	0.4960
<i>tier2perform</i>	54	0.4815	0.5043
<i>tier3perform</i>	54	0.1111	0.3172
<i>retention13yr</i>	27	0.6667	0.4804

The majority of the variables have similar means, showing little gender-related variation. However, the SWO community presents unique obstacles to family planning (and child-rearing) that are uncommon in civilian employment. For example, most private-sector jobs do not require employees to deploy for several months away from home. Because of distinct challenges in the SWO community, it is not surprising that women SWOs have different means among family-related variables. Women SWOs have a 30.3-ppt lower marriage rate than their male counterparts; nearly 84 percent of the male sample is married, compared to 53.7 percent for women. Female SWOs have 50-percent fewer dependents compared to male SWOs, as well.

Women demonstrate a higher percentage of tier-1 performance, with 40.7-percent of the female sub-sample placed into the tier-1 category, while tier-1 performers only

account for 34.9 percent of the male SWO sub-sample. However, women have a much larger percentage of tier-3 performers. Greater than 11.1 percent of the female sub-sample are categorized as tier-3 performers, while less than 4.9 percent of the male sub-sample are in the tier-3 performance category. Lastly, 60.2 percent of the male sub-sample is in tier 2, while 48.2 percent of the female sample is in the tier-2 performance category.

Table 34 depicts the results from the t-test for gender difference in group means for 13-year retention.

Table 34. T-test for Gender Difference in Group Means for 13-year Retention

	# of Obs.	Mean	Standard Deviation	t-stat	Df	P-Value (2-tailed)
Male	875	0.7531	0.4314	1.0223	900	0.3069
Female	27	0.6667	0.4804			

Based on the t-test for group means, there is statistically no difference in the retention rates between male and female SWOs at the 13-year retention level. This evidence contradicts results of past studies on retention among female Surface Warfare Officers, such as the study by Crawford et al. (2006). A possible explanation for the difference in results is that earlier studies tend to focus attention on female SWOs at the first port of exit, while this study uses the 13-year retention rate that is contingent upon promotion to Lieutenant Commander. Female SWOs, looking to raise children full-time, have likely already left active duty well before their O-4 promotion boards.

4. Surface Warfare Officer Cash Compensation

Table 35 provides a 20-year snapshot of Surface Warfare Officer annual compensation over the period from 1987 through 2006. Annualized for each calendar year, four components comprise the total cash compensation: basic pay, other pays, allowances, and bonuses. The FY 2008 monthly basic pay table, shown in Appendix A,

presents the primary component of SWO pay, while Table 23 lists the components of the other compensation variables. The basic pay table is based on rank and years of service. Other pays compensate SWOs for harsh work environments or provide compensation for specialized training, and include: hardship duty pay, hostile fire pay, and foreign language proficiency pay. Allowances compensate SWOs for the cost of living associated with more expensive duty locations and offset additional expenses. They include: Basic Allowance for Housing (BAH), Basic Allowance for Subsistence (BAS), Cost of Living Allowance (COLA), and Family Separation Allowance. Finally, bonuses such as the SWO Critical Skills Bonus are awarded to SWOs as a retention incentive and are limited to specific eligibility requirements, including policy changes over time.

Table 35. Descriptive Statistics of Pay by Calendar Year for SWO Sample

Variable	Whole SWO Sample			SWOs Receiving Pay in the CY		
	# of Obs.	Mean	Standard Deviation	# of Obs.	Mean	Standard Deviation
Calendar Year 2006						
<i>basicpay2006</i>	1331	\$62,999.76	\$27,281.03	1128	\$74,337.48	\$5,894.68
<i>otherpay2006</i>	1331	\$1,339.20	\$2,175.38	1128	\$1,580.21	\$2,281.12
<i>allowance2006</i>	1331	\$23,958.03	\$14,748.56	1128	\$28,269.63	\$11,606.26
<i>bonus2006</i>	1331	\$169.05	\$1,944.91	1128	\$199.47	\$2,111.39
<i>pay2006</i>	1331	\$88,466.04	\$39,504.71	1128	\$104,386.80	\$13,354.29
Calendar Year 2005						
<i>basicpay2005</i>	1331	\$61,962.34	\$23,129.44	1179	\$69,950.70	\$6,688.32
<i>otherpay2005</i>	1331	\$1,543.78	\$2,210.68	1179	\$1,742.81	\$2,273.89
<i>allowance2005</i>	1331	\$22,650.94	\$12,434.18	1179	\$25,571.17	\$9,991.07
<i>bonus2005</i>	1331	\$137.49	\$1,598.83	1179	\$155.22	\$1,698.05
<i>pay2005</i>	1331	\$86,294.55	\$33,225.53	1179	\$97,419.89	\$12,713.38
Calendar Year 2004						
<i>basicpay2004</i>	1331	\$58,925.18	\$20,824.79	1196	\$65,576.44	\$6,792.18
<i>otherpay2004</i>	1331	\$1,628.05	\$2,118.17	1196	\$1,811.82	\$2,158.76
<i>allowance2004</i>	1331	\$21,608.57	\$12,771.85	1196	\$24,047.67	\$11,083.51
<i>bonus2004</i>	1331	\$88.66	\$1,293.58	1196	\$98.66	\$1,364.33
<i>pay2004</i>	1331	\$82,250.46	\$30,603.39	1196	\$91,534.59	\$13,850.72
Calendar Year 2003						
<i>basicpay2003</i>	1331	\$56,115.63	\$18,464.44	1215	\$61,473.18	\$6,625.42
<i>otherpay2003</i>	1331	\$1,650.55	\$2,042.75	1215	\$1,808.14	\$2,070.36
<i>allowance2003</i>	1331	\$19,670.12	\$11,628.01	1215	\$21,548.09	\$10,374.50
<i>bonus2003</i>	1331	\$92.04	\$1,388.72	1215	\$100.82	\$1,453.25
<i>pay2003</i>	1331	\$77,528.34	\$27,122.73	1215	\$84,930.23	\$13,295.61

Calendar Year 2002						
<i>basicpay2002</i>	1331	\$52,947.50	\$15,820.15	1237	\$56,970.99	\$6,316.89
<i>otherpay2002</i>	1331	\$1,598.26	\$2,024.99	1237	\$1,719.72	\$2,050.23
<i>allowance2002</i>	1331	\$16,838.34	\$10,333.25	1237	\$18,117.89	\$9,575.75
<i>bonus2002</i>	1331	\$124.53	\$1,494.77	1237	\$133.99	\$1,550.16
<i>pay2002</i>	1331	\$71,508.63	\$23,479.09	1237	\$76,942.59	\$13,219.35
Calendar Year 2001						
<i>basicpay2001</i>	1331	\$48,757.66	\$13,478.45	1252	\$51,834.22	\$5,791.56
<i>otherpay2001</i>	1331	\$1,961.79	\$2,613.40	1252	\$2,085.58	\$2,646.28
<i>allowance2001</i>	1331	\$14,771.28	\$8,915.12	1252	\$15,703.33	\$8,357.66
<i>bonus2001</i>	1331	\$512.02	\$2,686.50	1252	\$544.32	\$2,766.85
<i>pay2001</i>	1331	\$66,002.74	\$20,118.46	1252	\$70,167.45	\$11,741.03
Calendar Year 2000						
<i>basicpay2000</i>	1331	\$45,770.64	\$12,526.48	1255	\$48,542.41	\$5,636.21
<i>otherpay2000</i>	1331	\$1,065.77	\$1,496.36	1255	\$1,130.31	\$1,517.16
<i>allowance2000</i>	1331	\$13,562.56	\$9,102.28	1255	\$14,383.88	\$8,720.64
<i>bonus2000</i>	1331	\$145.57	\$1,500.04	1255	\$154.38	\$1,544.39
<i>pay2000</i>	1331	\$60,544.54	\$18,489.70	1255	\$64,210.98	\$11,268.31
Calendar Year 1999						
<i>basicpay1999</i>	1331	\$41,610.82	\$10,609.73	1271	\$43,575.14	\$5,676.40
<i>otherpay1999</i>	1331	\$1,195.54	\$1,570.54	1271	\$1,251.98	\$1,585.06
<i>allowance1999</i>	1331	\$12,289.30	\$7,829.56	1271	\$12,869.44	\$7,531.68
<i>bonus1999</i>	1331	\$108.63	\$1,200.81	1271	\$113.76	\$1,228.62
<i>pay1999</i>	1331	\$55,204.29	\$15,723.65	1271	\$57,810.31	\$10,399.03
Calendar Year 1998						
<i>basicpay1998</i>	1331	\$38,373.41	\$9,630.60	1280	\$39,902.35	\$5,949.01
<i>otherpay1998</i>	1331	\$1,253.47	\$1,654.27	1280	\$1,303.42	\$1,667.51
<i>allowance1998</i>	1331	\$11,445.63	\$6,343.32	1280	\$11,901.67	\$6,034.10
<i>bonus1998</i>	1331	\$72.58	\$939.58	1280	\$75.47	\$958.02
<i>pay1998</i>	1331	\$51,145.09	\$14,028.60	1280	\$53,182.90	\$9,807.52
Calendar Year 1997						
<i>basicpay1997</i>	1331	\$35,407.29	\$9,338.22	1285	\$36,674.79	\$6,618.53
<i>otherpay1997</i>	1331	\$1,124.05	\$1,381.18	1285	\$1,164.29	\$1,388.92
<i>allowance1997</i>	1331	\$10,075.18	\$6,311.77	1285	\$10,435.84	\$6,123.64
<i>bonus1997</i>	1331	\$45.98	\$791.79	1285	\$47.63	\$805.80
<i>pay1997</i>	1331	\$46,652.50	\$13,481.02	1285	\$48,322.55	\$10,367.49
Calendar Year 1996						
<i>basicpay1996</i>	1331	\$26,796.11	\$15,035.91	1057	\$33,742.31	\$7,080.71
<i>otherpay1996</i>	1331	\$756.50	\$1,194.54	1057	\$952.60	\$1,268.93
<i>allowance1996</i>	1331	\$7,493.98	\$6,683.91	1057	\$9,436.60	\$6,157.71
<i>bonus1996</i>	1331	\$21.04	\$471.29	1057	\$26.49	\$528.77
<i>pay1996</i>	1331	\$35,067.62	\$20,285.48	1057	\$44,157.99	\$10,792.57

Calendar Year 1995						
<i>basicpay1995</i>	1331	\$27,204.17	\$13,344.70	1125	\$32,185.56	\$7,088.54
<i>otherpay1995</i>	1331	\$621.05	\$1,124.98	1125	\$734.77	\$1,189.08
<i>allowance1995</i>	1331	\$7,609.42	\$6,614.11	1125	\$9,002.78	\$6,261.68
<i>bonus1995</i>	1331	\$15.03	\$387.49	1125	\$17.78	\$421.45
<i>pay1995</i>	1331	\$35,449.66	\$18,125.33	1125	\$41,940.89	\$10,781.85
Calendar Year 1994						
<i>basicpay1994</i>	1331	\$22,204.05	\$15,079.81	953	\$31,011.11	\$6,654.97
<i>otherpay1994</i>	1331	\$495.28	\$1,048.68	953	\$691.73	\$1,183.37
<i>allowance1994</i>	1331	\$6,257.27	\$5,936.54	953	\$8,739.16	\$5,246.28
<i>bonus1994</i>	1331	\$0.00	\$0.00	953	\$0.00	\$0.00
<i>pay1994</i>	1331	\$28,956.60	\$19,983.64	953	\$40,442.00	\$9,639.98
Calendar Year 1993						
<i>basicpay1993</i>	1331	\$19,372.90	\$14,669.92	889	\$29,004.88	\$6,529.66
<i>otherpay1993</i>	1331	\$365.67	\$912.96	889	\$547.48	\$1,071.78
<i>allowance1993</i>	1331	\$5,519.04	\$5,261.31	889	\$8,263.05	\$4,331.33
<i>bonus1993</i>	1331	\$37.57	\$611.99	889	\$56.24	\$748.26
<i>pay1993</i>	1331	\$25,295.19	\$19,337.93	889	\$37,871.64	\$9,124.88
Calendar Year 1992						
<i>basicpay1992</i>	1331	\$16,061.08	\$13,915.25	806	\$26,522.71	\$6,488.61
<i>otherpay1992</i>	1331	\$372.27	\$975.63	806	\$614.75	\$1,193.06
<i>allowance1992</i>	1331	\$4,774.90	\$5,560.48	806	\$7,885.10	\$5,150.60
<i>bonus1992</i>	1331	\$9.02	\$279.49	806	\$14.89	\$359.12
<i>pay1992</i>	1331	\$21,217.27	\$18,691.79	806	\$35,037.45	\$9,613.33
Calendar Year 1991						
<i>basicpay1991</i>	1331	\$12,538.21	\$12,741.18	699	\$23,874.61	\$6,187.52
<i>otherpay1991</i>	1331	\$235.15	\$711.91	699	\$447.76	\$932.94
<i>allowance1991</i>	1331	\$3,666.18	\$4,325.34	699	\$6,980.94	\$3,531.95
<i>bonus1991</i>	1331	\$0.00	\$0.00	699	\$0.00	\$0.00
<i>pay1991</i>	1331	\$16,439.53	\$16,711.44	699	\$31,303.31	\$8,135.45
Calendar Year 1990						
<i>basicpay1990</i>	1331	\$9,510.25	\$11,178.95	582	\$21,749.38	\$4,406.99
<i>otherpay1990</i>	1331	\$181.04	\$594.09	582	\$414.02	\$843.39
<i>allowance1990</i>	1331	\$2,678.71	\$3,706.86	582	\$6,126.06	\$3,209.34
<i>bonus1990</i>	1331	\$0.00	\$0.00	582	\$0.00	\$0.00
<i>pay1990</i>	1331	\$12,370.00	\$14,648.35	582	\$28,289.46	\$6,329.73
Calendar Year 1989						
<i>basicpay1989</i>	1331	\$6,607.11	\$9,459.00	552	\$15,931.28	\$8,194.69
<i>otherpay1989</i>	1331	\$52.34	\$321.83	552	\$126.20	\$490.58
<i>allowance1989</i>	1331	\$2,011.84	\$3,049.31	552	\$4,851.02	\$2,940.45
<i>bonus1989</i>	1331	\$10.52	\$144.71	552	\$25.36	\$223.99
<i>pay1989</i>	1331	\$8,681.81	\$12,294.03	552	\$20,933.86	\$10,386.54

Calendar Year 1988						
<i>basicpay1988</i>	1331	\$3,813.29	\$7,275.59	517	\$9,817.18	\$8,796.77
<i>otherpay1988</i>	1331	\$32.82	\$243.59	517	\$84.49	\$385.45
<i>allowance1988</i>	1331	\$1,595.21	\$2,802.22	517	\$4,106.81	\$3,147.24
<i>bonus1988</i>	1331	\$6.01	\$134.20	517	\$15.47	\$215.11
<i>pay1988</i>	1331	\$5,447.32	\$9,874.43	517	\$14,023.95	\$11,437.14
Calendar Year 1987						
<i>basicpay1987</i>	1331	\$1,946.84	\$5,317.33	511	\$5,070.93	\$7,606.64
<i>otherpay1987</i>	1331	\$10.91	\$134.45	511	\$28.41	\$215.96
<i>allowance1987</i>	1331	\$959.74	\$1,746.62	511	\$2,499.83	\$2,024.39
<i>bonus1987</i>	1331	\$0.00	\$0.00	511	\$0.00	\$0.00
<i>pay1987</i>	1331	\$2,917.49	\$6,848.31	511	\$7,599.17	\$9,309.10

The “Whole SWO Sample” category consists of 1,331 observations, including those officers who promoted to the rank of Lieutenant Commander between 9 YCS and 12 YCS. The number of “SWOs Receiving Pay in the CY” varies markedly from the “Whole SWO Sample,” dependent on the year being analyzed. This sub-sample will always be smaller than the whole sample due to the time component, since not all SWOs who promoted to O-4 served until December of each year and, therefore, left active duty earlier. In calendar year (CY) 1987, for example, only 511 SWOs (e.g., officers in very junior ranks, such as O-1s or O-2s) were in the dataset. Over time, this number increased as more officers accessed into the Navy and more retained longer on active duty. Group means in CY 1997 depicted the closest similarity between the “Whole SWO Sample” and “SWOs Receiving Pay in the CY.” Since the “Whole SWO Sample” has zero dollar values for years that the SWOs received no compensation (due to officers not being on active duty), the total pay for the “Whole SWO Sample” underreports the sample mean for each pay in each calendar year.

G. ECONOMETRIC MODEL RESULTS

1. 13-year Retention Models

The results from the 13-year retention regression models are contained in Table 36. Column (1) shows the results from the linear probability model (LPM) with robust standard errors. Column (2) displays results from the probit regression model, and column (3) presents the partial effects of the independent variables from the probit model.

Table 36. 13-year Retention Regression Models

Variables	(1) LPM, Robust SE	(2) Probit Model	(3) Partial Effects from Probit Model
Dependent Variable	<i>retention13yr</i>	<i>retention13yr</i>	<i>retention13yr</i>
<i>age</i>	-0.0090 (0.0079)	-0.0348 (0.0304)	-0.0103 (0.0090)
<i>dependents</i>	0.0371 (0.0106)***	0.1482 (0.0441)***	0.0437 (0.0130)***
<i>prienlist</i>	0.0544 (0.0503)	0.2067 (0.2065)	0.0577 (0.0544)
<i>female</i>	0.0617 (0.0688)	0.2250 (0.3085)	0.0608 (0.0755)
<i>amerindian</i>	-0.1689 (0.2202)	-0.6991 (0.7221)	-0.2500 (0.2867)
<i>asian</i>	0.0810 (0.0662)	0.3026 (0.3159)	0.0791 (0.0718)
<i>black</i>	0.0573 (0.0455)	0.2065 (0.1695)	0.0570 (0.0435)
<i>hispanic</i>	-0.0183 (0.0670)	-0.0809 (0.2176)	-0.0245 (0.0677)
<i>other</i>	-0.0390 (0.1301)	-0.3855 (0.4405)	-0.1287 (0.1615)
<i>married</i>	0.0618 (0.0473)	0.1766 (0.1496)	0.0543 (0.0479)
<i>masters</i>	0.0692 (0.0281)**	0.2666 (0.1168)**	0.0752 (0.0314)**
<i>postmasters</i>			
<i>JPMEph1</i>	0.1805 (0.0272)***		
<i>JPMEph2</i>	0.1570 (0.0365)***		
<i>OCS</i>	0.0168 (0.0381)	0.0315 (0.1425)	0.0092 (0.0415)
<i>othercomm</i>	0.2047 (0.0587)***	0.8565 (0.3570)**	0.1739 (0.0432)***
<i>command</i>	0.2008 (0.0200)***	1.5127 (0.3673)***	0.2524 (0.0229)***
<i>tier2perform</i>	-0.0638 (0.0333)*	-0.2643 (0.1449)*	-0.0738 (0.0380)*
<i>tier3perform</i>	-0.4980 (0.0651)***	-1.4116 (0.2262)***	-0.5133 (0.0771)***
Constant	0.8309 (0.1843)***	1.0888 (0.7104)	
Observations	902	855	855
R-squared	0.18		
Notes: Standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%			

When compared to tier-2 and tier-3 performers, holding all else constant, being a tier-1 performer increases the probability of 13-year retention. Based on the partial effects from the probit model, tier-2 performers have a 7.38-percentage point (ppt) lower retention probability than tier-1 performers, which is statistically significant at the 10-percent significance level. Even more significant (at the 1-percent level), tier-3 performers have a 51.33-ppt lower retention probability than tier-1 performers. These results differ from the predicted “curvilinear” relationship between performance and retention, since tier-1 performers have a higher retention rate than tier-2 performers.

Figure 36 displays the effect of each performance tier on the 13-year retention rate, including both the raw retention rate from the descriptive statistics and the adjusted rate from regression results.

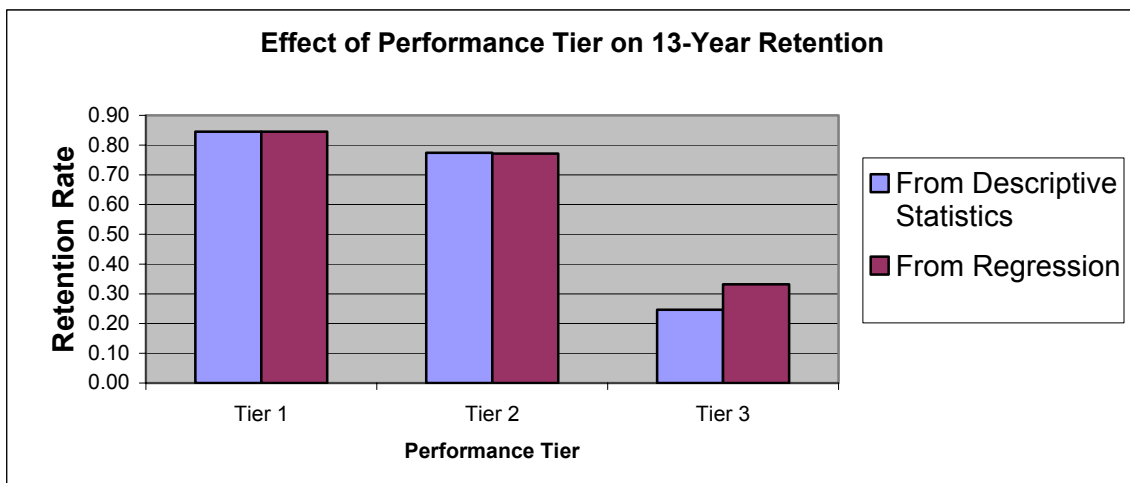


Figure 36. Effect of Performance Tier on 13-year Retention—Comparison of Descriptive Statistics and Regression Results

The retention rates for each tier are comparable between the values generated from the probit model and the sample means. Under both scenarios, tier-1 performers have an average 13-year retention rate of 84.52 percent. Adjusted for performance tier partial effects from the probit model, tier-2 performers have a 13-year retention rate of 77.14 percent, compared to the retention rate of 77.41 percent from the descriptive statistics. Tier-3 performers retain at a meager 33.19 percent based on regression results,

contrasted to the 24.59-percent retention rate from the sample mean among tier-3 performers. The similarities between the raw and adjusted retention rates are consistent with the hypothesis that the performance proxy (i.e., time to promote to O-4) is capturing all observable performance measures.

The partial effects of other independent variables were found to be statistically significant in the 13-year retention models, analyzing the results at the margin while holding all else equal (i.e., *ceteris paribus*). Significant at the 1-percent significance level, the number of dependents had a positive effect on 13-year retention. One additional family member (or dependent) increases the probability of retention by 4.37-percentage points. Officers taking care of larger families generally value the job security and the retirement annuity the Navy provides, and may be more inclined to retain for at least 20 years of service.

Compared to SWOs with only a bachelor's degree, officers who possess a master's degree have a statistically significant 7.52-ppt increase in the probability of retention through 13 YCS. This may indicate that the SWO community values higher education and provides incentives for graduate degrees, which increase the probability of retention. The *postmasters* independent variable dropped from the econometric models due to unobserved collinearity. Though JPME Phase I and Phase II are both positive and statistically significant in the LPM results, both joint education milestones predict retention perfectly and are, therefore, left out of the probit model. According to the human capital model, SWOs investing time and energy to earn joint education (i.e., military-specific training) are more likely to retain in the Navy. This increase in human capital is non-transferable to other civilian jobs.

The variable *othercomm*, representing other commissioning sources (e.g., Aviation Cadet Program, Direct Appointment Program, Aviation Training Program, etc.), yields a positive and statistically significant partial effect on the probability of 13-year retention. There is an unobservable factor that is unique to these commissioning sources that capitulates a 17.39-ppt increase in the probability of 13-year retention when compared to SWOs commissioned through the NROTC program.

Command status, *command*, has a statistically significant effect on retention. Having held, or currently holding, command of a unit increases the probability of 13-year retention by 25.24 percentage points, controlling for all other independent variables. Since holding command is a major career milestone in a SWO's career, investing time in such a position yields Navy-specific benefits (such as positional prestige and increased promotion opportunities) that are forfeited if the officer decides to leave the service.

2. Tier Characteristics Models

a. Tier-1 Characteristics

Analyzing the quality characteristics of tier-1 performers, Table 37 contains the results from regression models that predict the probability of being classified into the tier-1 performance category.

Table 37. Tier-1 Characteristics Regression Models

Variables	(1) LPM, Robust SE	(2) Probit Model	(3) Partial Effects from Probit Model
Dependent Variable	<i>tier1perform</i>	<i>tier1perform</i>	<i>tier1perform</i>
<i>age</i>	0.0043 (0.0078)	0.0122 (0.0204)	0.0045 (0.0075)
<i>dependents</i>	0.0002 (0.0104)	-0.0005 (0.0298)	-0.0002 (0.0110)
<i>prienlist</i>	0.0884 (0.0500)*	0.2290 (0.1335)*	0.0861 (0.0510)*
<i>female</i>	0.0793 (0.0704)	0.2281 (0.1826)	0.0870 (0.0715)
<i>amerindian</i>	0.1409 (0.1770)	0.3593 (0.4969)	0.1392 (0.1980)
<i>asian</i>	-0.0921 (0.0622)	-0.2962 (0.2231)	-0.1022 (0.0708)
<i>black</i>	-0.0973 (0.0419)**	-0.2708 (0.1206)**	-0.0950 (0.0399)**
<i>hispanic</i>	-0.0597 (0.0561)	-0.1573 (0.1495)	-0.0563 (0.0517)
<i>other</i>	-0.4177 (0.0474)***		
<i>married</i>	0.0285 (0.0398)	0.0884 (0.1153)	0.0322 (0.0415)
<i>masters</i>	-0.0411 (0.0288)	-0.1227 (0.0855)	-0.0447 (0.0307)
<i>postmasters</i>	-0.0420 (0.1528)	-0.1323 (0.3803)	-0.0474 (0.1321)
<i>JPMEph1</i>	-0.0972 (0.0754)	-0.2981 (0.2602)	-0.1026 (0.0823)
<i>JPMEph2</i>	-0.2602 (0.0521)***	-1.2194 (0.5390)**	-0.2969 (0.0612)***
<i>OCS</i>	0.1837 (0.0370)***	0.4981 (0.0994)***	0.1889 (0.0382)***
<i>othercomm</i>	0.1587 (0.0598)***	0.4536 (0.1620)***	0.1760 (0.0642)***
<i>command</i>	-0.0564 (0.0433)	-0.1709 (0.1362)	-0.0611 (0.0470)
Constant	0.1780 (0.1789)	-0.8806 (0.4764)*	
Observations	1331	1318	1318
R-squared	0.08		
Notes: Standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%			

None of the quality variables (i.e., graduate education, completion of JPME Phases I and II, and command opportunity) have the hypothesized positive effect on being categorized into tier 1. In fact, the only statistically significant quality variable,

JMPE Phase II, has a large negative partial effect. This result is counterintuitive, since completing JMPE Phase II is a positive factor during SWO promotion boards.

However, having at least 4 years of prior-enlisted experience increases the probability of being categorized as a tier-1 performer by 8.61-ppts, which is statistically significant at the 10-percent significance level. Since prior-enlisted experience increases a SWO's human capital based on more military-specific training, this experience is reflected in early promotion rates and contributes toward classification as a tier-1 performer.

Race and ethnicity variables yield mixed results in the tier-1 characteristics regression models. Compared to Caucasian SWOs, holding all other independent variables constant, being African American reduces the probability of being categorized as a tier-1 performer by 9.5-percentage points. Additionally, SWOs who are classified as being other races or ethnicities (i.e., the variable *other*) are excluded in the probit model, since this categorization perfectly predicts officers not being categorized as tier-1 performers.

SWOs accessing through the NROTC commissioning program have a reduced probability of being classified as a tier-1 performer, compared to OCS and other commissioning sources. Statistically significant at the 1-percent level, commissioning through OCS increases the probability of being categorized in tier 1 by 18.89-ppts, and accession through other commissioning programs increase the probability of being a tier-1 performer by 17.6-ppts.

b. Tier-2 Characteristics

Table 38 depicts regression model results, predicting the partial effects of individual characteristics influencing the probability of being classified as a tier-2 performer.

Table 38. Tier-2 Characteristics Regression Models

Variables	(1) LPM, Robust SE	(2) Probit Model	(3) Partial Effects from Probit Model
Dependent Variable	<i>tier2perform</i>	<i>tier2perform</i>	<i>tier2perform</i>
<i>age</i>	0.0031 (0.0077)	0.0079 (0.0204)	0.0030 (0.0079)
<i>dependents</i>	0.0104 (0.0106)	0.0294 (0.0294)	0.0113 (0.0113)
<i>prienlist</i>	-0.0863 (0.0503)*	-0.2190 (0.1332)	-0.0852 (0.0523)
<i>female</i>	-0.1114 (0.0701)	-0.2931 (0.1817)	-0.1155 (0.0724)
<i>amerindian</i>	-0.1477 (0.1769)	-0.3938 (0.4971)	-0.1557 (0.1968)
<i>asian</i>	0.0799 (0.0677)	0.2406 (0.2128)	0.0891 (0.0751)
<i>black</i>	0.0785 (0.0432)*	0.2130 (0.1179)*	0.0797 (0.0427)*
<i>hispanic</i>	0.0679 (0.0570)	0.1822 (0.1479)	0.0684 (0.0538)
<i>other</i>	0.2658 (0.1014)***	0.8794 (0.4465)**	0.2703 (0.0938)***
<i>married</i>	0.0174 (0.0420)	0.0487 (0.1116)	0.0188 (0.0433)
<i>masters</i>	0.0912 (0.0292)***	0.2603 (0.0846)***	0.0981 (0.0311)***
<i>postmasters</i>	0.0783 (0.1468)	0.2114 (0.3839)	0.0786 (0.1367)
<i>JPMEph1</i>	0.1355 (0.0788)*	0.4057 (0.2589)	0.1447 (0.0832)*
<i>JPMEph2</i>	0.2858 (0.0570)***	1.2859 (0.5317)**	0.3386 (0.0664)***
<i>OCS</i>	-0.2104 (0.0368)***	-0.5605 (0.0993)***	-0.2185 (0.0384)***
<i>othercomm</i>	-0.1437 (0.0610)**	-0.3889 (0.1597)**	-0.1534 (0.0632)**
<i>command</i>	0.1004 (0.0432)**	0.3015 (0.1357)**	0.1110 (0.0472)**
Constant	0.5184 (0.1778)***	0.0431 (0.4743)	
Observations	1331	1331	1331
R-squared	0.08		
Notes: Standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%			

Several quality characteristics have a positive effect on being classified as a tier-2 performer. Compared with SWOs who only have a bachelor's degree, SWOs who possess a master's degree increase their probability of being categorized in tier 2 by 9.81-ppts, which is statistically significant at the 1-percent level. Completing JPME Phase II yields a 33.86-ppt increase in being classified as a tier-2 performer. Additionally, command status has a statistically significant effect on being a tier-2 performer. Having held or currently holding command of a unit increases the probability by 11.1-ppts, which is statistically significant at the 5-percent level.

Race and ethnicity variables have mixed results. There is weak statistical evidence that African Americans have a 7.97-ppt increased probability of being classified as a tier-2 performer compared to Caucasian SWOs. Furthermore, officers categorized as being *other* races or ethnicities have a 27.03-ppt increased probability of being a tier-2 performer at the 5-percent significance level.

The majority of tier-2 performers earn their commission through the NROTC program. Statistically significant at the 1-percent level, commissioning through OCS decreases the probability of being categorized as a tier-2 performer by 21.85-ppts. The variable *othercomm*, or other commissioning sources, decreases the probability of being categorized as a tier-2 performer by 15.34-percentage points, which is statistically significant at the 5-percent significance level.

c. Tier-3 Characteristics

To examine the partial effects of individual characteristics influencing the probability of being classified as a tier-3 performer, Table 39 presents the regression model results for tier-3 performers.

Table 39. Tier-3 Characteristics Regression Models

Variables	(1) LPM, Robust SE	(2) Probit Model	(3) Partial Effects from Probit Model
Dependent Variable	<i>tier3perform</i>	<i>tier3perform</i>	<i>tier3perform</i>
Age	-0.0075 (0.0033)**	-0.0989 (0.0438)**	-0.0076 (0.0033)**
<i>dependents</i>	-0.0106 (0.0042)**	-0.1681 (0.0622)***	-0.0129 (0.0047)***
<i>prienlist</i>	-0.0021 (0.0228)	-0.0275 (0.2707)	-0.0021 (0.0203)
<i>female</i>	0.0321 (0.0429)	0.1819 (0.2615)	0.0162 (0.0269)
<i>amerindian</i>	0.0068 (0.0205)		
<i>asian</i>	0.0122 (0.0394)	0.1383 (0.3263)	0.0119 (0.0314)
<i>black</i>	0.0188 (0.0213)	0.2009 (0.2000)	0.0178 (0.0202)
<i>hispanic</i>	-0.0082 (0.0209)	-0.1490 (0.3070)	-0.0102 (0.0185)
<i>other</i>	0.1518 (0.0957)	1.2298 (0.5377)**	0.2416 (0.1769)
<i>married</i>	-0.0459 (0.0258)*	-0.2222 (0.1707)	-0.0195 (0.0171)
<i>masters</i>	-0.0501 (0.0094)***	-0.8782 (0.2473)***	-0.0481 (0.0093)***
<i>postmasters</i>	-0.0363 (0.0190)*		
<i>JPMEph1</i>	-0.0383 (0.0100)***		
<i>JPMEph2</i>	-0.0256 (0.0128)**		
<i>OCS</i>	0.0267 (0.0171)	0.3603 (0.1803)**	0.0323 (0.0185)*
<i>othercomm</i>	-0.0150 (0.0219)	-0.3256 (0.3682)	-0.0193 (0.0163)
<i>command</i>	-0.0440 (0.0071)***		
Constant	0.3036 (0.0842)***	1.2659 (0.9989)	
Observations	1331	1160	1160
R-squared	0.05		
Notes: Standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%			

As hypothesized, tier-3 performers do not exhibit the quality characteristics desired by the SWO community. Compared to officers with bachelor's degrees, having a master's degree decreases the probability of being classified as a tier-3 performer by 4.81-ppts, which is statistically significant at the 1-percent significance level. Possessing a post-master's degree or higher, completing JPME Phase I or Phase II, and having held or currently holding command all perfectly predict that a SWO will not be classified as a tier-3 performer. Therefore, tier-3 performers practically correspond to "above zone" promoted Lieutenant Commanders (O-4).

Conversely, demographic variables yield varied results. As a maturity indicator, accession age has a small negative effect on being classified a tier-3 performer. Holding all else constant, a one-year increase in age will decrease the probability of being categorized as a tier-3 performer by 0.76-ppts, which is statistically significant at the 5-percent level. However, this value has a negligible impact on tier classification. The number of dependents also yielded a statistically significant negative effect on being categorized in tier 3. An additional dependent will yield a 1.29-ppt decrease in the probability of being a tier-3 performer. When compared to Caucasian officers, SWOs categorized in *other* races or ethnicities have a 24.16-ppt increase in the probability of being classified as tier-3 performers, which is statistically significant at the 5-percent significance level. Additionally, no SWOs with American Indian heritage are classified as tier-3 performers; therefore, the *amerindian* variable is not used in the probit model.

Commissioning via the OCS program yields a statistically significant 3.23-ppt increase in an officer's probability of being classified into the tier-3 performance category, *ceteris paribus*, when compared to officers commissioned through NROTC.

3. Pay Elasticity Models

Pay elasticity model results for tier-1 performers are detailed in Appendix C. The results for tier-2 performers are illustrated in Appendix D, and Appendix E contains the pay elasticity model results for tier-3 performers. The pay elasticity coefficients for each performance tier, which are all statistically significant at the 1-percent significance level, are summarized in Table 40.

Table 40. Pay Elasticity Coefficients from Econometric Models by Performance Tier

Performance Tier	LPM, robust SE	Partial Effects from the Probit Models
Tier-1 Performer	0.0151	0.0155
Tier-2 Performer	0.0129	0.0112
Tier-3 Performer	0.0158	0.0236
Note: All coefficients are statistically significant at the 1% significance level		

According to the results of the pay elasticity models, cash compensation has a statistically significant positive, but small effect on 13-year retention for all performance tiers. Interpreting the partial effects from the probit models, a 1-percent increase in pay yields:

- A 1.55-ppt increase in 13-year retention for tier-1 performers
- A 1.12-ppt increase in 13-year retention for tier-2 performers
- A 2.36-ppt increase in 13-year retention for tier-3 performers

These pay elasticity results by performance tier differ significantly from the hypothesized effects, as higher pay and bonuses have a greater retention effect on tier-3 performers compared to tier-1 and tier-2 performers. Therefore, a much smaller pay increase (or decrease) will have a magnified effect for tier-3 performers. These pay elasticity results are used to adjust base 13-year retention rates accordingly, when varying bonus payments in the following optimization models.

H. OPTIMIZATION MODEL RESULTS

1. Theoretical Current Situation

Table 41 illustrates the theoretical current situation, which is used to derive the available pool of SWOs in each performance tier within the total budgetary constraint.

Table 41. Theoretical Current Retention and Budget Situation

Performance Tier	Probability of Categorization into a Tier	SWOs in Each Tier (at promotion)	Base 13-year Retention Rate	SWOs Retained (at 13 YCS)	PV of Bonus Payments
Tier 1	0.3516	89	0.8452	75	\$3,277,216.35
Tier 2	0.5973	151	0.7714	116	\$5,068,761.29
Tier 3	0.0511	13	0.3319	4	\$174,784.87
Totals:		252		195	\$8,520,762.51

The probabilities categorizing SWOs into each tier are derived using the tier category composition from the sample descriptive statistics. In the SWO sample, tier-1 performers account for approximately 35.16 percent of the sample, tier-2 performers represent 59.73 percent, and tier-3 performers are 5.11 percent of the sample. This distribution is applied to the 252 SWOs selected for promotion by the FY 2007 Lieutenant Commander promotion board to generate the performance tier allocation (Commander Navy Personnel Command, 2008a). This distribution is used as the available pool constraint in the optimization models with the number of SWOs in each tier rounded to the nearest integer.

The base 13-year retention rate for tier-1 performers is provided in the descriptive statistics, found in Table 28. The 13-year retention rate for tier-2 performers is calculated by adjusting the retention rate of tier-1 performers by the partial effects of tier-2 performers from the 13-year retention probit model. Similar methodology is applied to tier-3 performers to yield their base 13-year retention rate. Applying the base 13-year retention rates to the number of Lieutenant Commanders in each tier at the time of promotion produces the number of SWOs retained through the port of exit at 13 YCS. Of the 252 SWOs promoted to O-4, 195 SWOs are predicted to retain to 13 YCS. Multiplying 195 SWOs by the net present value (NPV) of the current SWO Critical Skills Bonus (i.e., \$43,696.22) yields the NPV of the total bonus payments, approximately \$8.52 million. This value constitutes the budgetary constraint for the optimization models.

2. Maximizing 13-year Retention and Maximizing the Retention Bonus Differential (between Performance Tiers) Models

Appendix F displays the results of the 13-year retention optimization model. Appendix G depicts the results from the bonus differential optimization model. The two optimization model results are compared with the theoretical current situation in Table 42.

Table 42. Comparison of Optimization Model Results

Decision Metrics	Current Situation (Theoretical)	(1) 13-year Retention Optimization Model	(2) Bonus Differential Optimization Model
13-year Retention			
Tier-1 Retention	75	81	89
Tier-2 Retention	116	112	104
Tier-3 Retention	4	0	0
Total 13-year Retention	195	193	193
NPV of Retention Bonus Payments by Performance Tier			
NPV of Tier-1 Bonus Payment	\$43,696.22	\$45,526.17	\$48,060.20
NPV of Tier-2 Bonus Payment	\$43,696.22	\$42,538.34	\$40,471.35
NPV of Tier-3 Bonus Payment	\$43,696.22	\$37,550.97	\$37,550.97
Total Costs and Savings to the Navy			
Total Costs	\$8,520,762.51	\$8,451,913.84	\$8,486,378.16
Total Savings		\$68,848.67	\$34,384.35

To establish a tiered-bonus structure and remain within the existing budget, the optimization models reduce the total number of SWOs retaining through 13 YCS by 2 officers. However, these 2 SWOs are likely tier-3 performers. By comparison to the current theoretical situation, the composition of the retained officers supports 6 more tier-1 performers in the first optimization model and 14 more tier-1 performers in the second optimization model. Retaining higher numbers of tier-1 performers increases the quality of the SWO community. Based on the methodology to create the three performance tiers from the DMDC dataset, tier-1 performers exhibit characteristics highly desired by SWO Lieutenant Commander promotion boards. Since graduate education, JPME completion,

and command status are all statistically insignificant variables in the tier-1 characteristics probit model, these desirable characteristics most likely include indicators not observed in the dataset, postulated as on-the-job performance. Additionally, promotion boards consider person-job fit when selecting officers for promotion to O-4 (Fairburn & Malcomson, 2001). Therefore, tier-1 performers are identified as having a good person-job fit, which benefits both the officer and the SWO community.

Moreover, tier-1 performers have a higher probability of retention than tier-2 and tier-3 performers. Since there is a better person-job fit among tier-1 performers, this retention trend may extend beyond 13 YCS. Conversely, tier-3 performers have a very low probability of 13-year retention. If the conditional probability of retention trend continues in later years, retaining tier-3 performers at 13 YCS may be detrimental to the manpower plans for the SWO community. These officers have a higher probability of leaving after the 3-year SWO Critical Skills Bonus obligation is complete. The Navy must consider the effect of retaining tier-3 performers.

Furthermore, tier-3 performers have a lower probability of promoting to Commander (O-5) by 18 YCS. At the 18 YCS point in a SWO's career, tier-3 performers have had at least one opportunity to be considered by an O-5 promotion board. The mean promotion probabilities are presented in Table 43.

Table 43. Comparison of Mean Probabilities for Promotion to Commander by 18 YCS and by Performance Tier

Performance Tier	# of Obs.	Mean	Standard Deviation
Tier-1 Performers	30	0.7333	0.4498
Tier-2 Performers	234	0.6581	0.4754
Tier-3 Performers	16	0.2500	0.4472

Based on the cohort constructs, the DMDC sample contains 280 SWOs who retained through 18 YCS. Given this sample, the O-5 promotion rate for tier-1 performers is 73.33 percent, 65.81 percent for tier-2 performers, and a meager 25 percent for tier-3 performers. The large promotion difference between tier-3 performers and

higher performers implies that tier-3 performers continue to exhibit poor performance and poor individual-job match at later points in their careers. For Surface Warfare Officers, if an officer does not promote to Commander, that officer will never hold Commander Command. These low performers add limited value to the SWO community, since heavy emphasis is placed on the importance of Commander Command. Throughout a SWO's career, the Navy invests heavily in the training and preparation for the rigor of Commander Command. SWOs who do not promote to O-5 are poor investments for the SWO community. Additionally, non-prior-enlisted O-4s who do not promote to O-5 by 18 YCS will likely retire after 20 years of service. In the "up-or-out" promotion system, O-4s in their terminal rank are required to retire at the 20-year mark, with very few exceptions (Secretary of the Navy, 2005). Identifying these poor performers earlier in their career and encouraging functional turnover will save the Navy money in the long-term. Therefore, decreasing the number of tier-3 performers and increasing the number of tier-1 and tier-2 performers will improve the overall quality of the SWO community. By increasing the percentage of the sample that are eligible for promotion to O-5, the Navy would thereby increase the number of SWOs eligible for Commander Command while simultaneously reducing the current shortage in the O-5 ranks. For example, the resultant composition among tiers for both optimization models yields an additional Commander (O-5) by 18 YCS.

Comparing the two optimization models in Table 42, there is a trade-off between the distribution of tiers and the total bonus expenditure. Though the second optimization model, found in column (2), retains 8 more tier-1 performers and retains 8 fewer tier-2 performers than the solution from the first optimization model, the resultant cost increases by \$34,464.32. However, both optimization models yield a net financial savings to the Navy, primarily due to the reduced overall retention of 2 SWOs.

Though both optimization models simulate the effect of adding a performance-based component to the SWO Critical Skills Bonus, the bonus payment differentials between performance tiers are maximized by the second optimization model, in column (2) of Table 42. This bonus structure creates a higher incentive for tier-1 performers to retain. Furthermore, a performance-based bonus structure may have spillover effects for

more junior SWOs, who are in earlier years of their careers. If they witness that higher performance is rewarded by higher retention bonus payments, they may be motivated to increase their own performance.

3. Cost-benefit Analysis of Increasing SWO Retention beyond the Optimal Solution

An additional set of four optimization models address the impact of relaxing the retention constraint to meet the 195 SWOs observed in the theoretical current retention model, found in Table 41. Column (1) matches the retention of 195 SWOs. The models in columns (2) through (4) increase the retention requirement by 5 SWOs per model, while minimizing the total cost to implement the program. The other constraints and decision variables remain the same as in the first two optimization models located in Table 42. Presented as a cost-benefit analysis, the results of these optimization models are contained in Table 44.

Table 44. Cost-benefit Analysis of the Trade-off between Retention and Total Cost

Decision Metrics	(1) 195 SWOs Retained	(2) 200 SWOs Retained	(3) 205 SWOs Retained	(4) 210 SWOs Retained
Benefits				
Tier-1 Retention	83	84	87	89
Tier-2 Retention	112	116	118	121
Tier-3 Retention	0	0	0	0
Total Retention	195	200	205	210
Costs				
NPV of Tier-1 Bonus Payment	\$46,159.68	\$46,476.43	\$47,426.69	\$48,060.20
NPV of Tier-2 Bonus Payment	\$42,538.34	\$43,571.84	\$44,088.58	\$44,863.71
NPV of Tier-3 Bonus Payment	\$37,550.97	\$37,550.97	\$37,550.97	\$37,550.97
Total Cost	\$8,595,547.40	\$8,958,353.30	\$9,328,575.35	\$9,705,866.53
Total Excess Cost to the Navy	\$74,784.88	\$437,590.79	\$807,812.83	\$1,185,104.02

These models address the trade-off between retention and cost under a performance-based bonus structure. For example, 195 SWOs (i.e., 2 more tier-1 performers than in the original optimization model) can be retained for \$74,784.88 more than the original budget. Retaining 200 SWOs through 13 YCS would cost the Navy an extra \$437,590.79. Figure 37 provides an illustration of the additional cost (increase compared to the theoretical current situation) plotted against the total number of retained Surface Warfare Officers. Though this function appears to be linear, the constraints prevent perfect linearity.

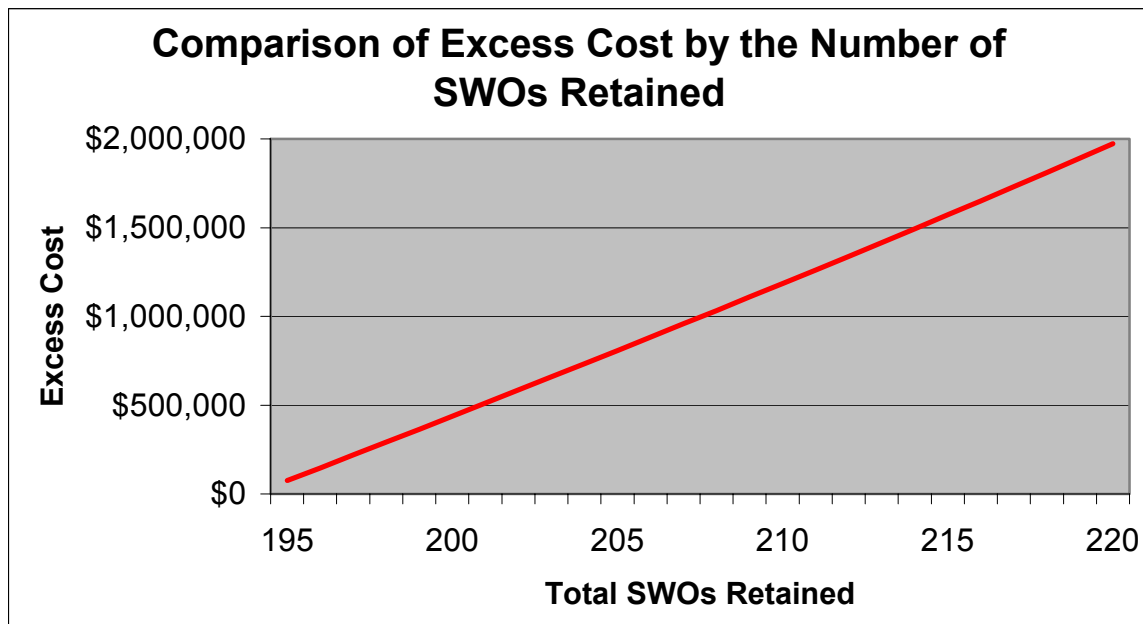


Figure 37. Comparison of Excess Cost by the Number of SWOs Retained

Increasing SWO retention bares a significant cost with growth beyond the retention level of 193 SWOs. Navy leadership must decide the marginal value of retaining an additional SWO (by performance tier) to determine which option would yield a positive net return on investment.

4. Cafeteria-style Retention Bonus Options

Further savings to the Navy might be realized through optimizing the payment plan to take advantage of individual SWOs' personal discount rates that exceed the

federal standard 7-percent discount rate used in this study's computations. Higher personal discount rates can allow a larger initial lump-sum payment for the SWO Critical Skills Bonus, which will provide long-term savings to the Navy—since the NPV of the lump-sum payment is smaller than the NPV of the typical payment plan over three installments. By creating a cafeteria-style retention bonus system, where SWOs can select the option that best meets their needs, the Navy can potentially save money in the aggregate due to the difference between the federal standard discount rate (i.e., 7 percent) and higher personal discount rates among Surface Warfare Officers (OMB, 1992).

Using estimates from bivariate probit models, Warner and Pleeter (2001) found the average officer separating from active duty had a 21-percent personal discount rate. Furthermore, “personal discount rates decline with income, education, and age” (p .37). Holding separation constant, Warner and Pleeter (2001) estimated the mean nominal discount rate to be 18 percent for officers with 11 years of service and 13.2 percent for officers with 13 years of service. Though each individual officer has a unique personal discount rate, using Warner and Pleeter's (2001) results as a baseline, the personal discount rate used in this analysis is 15 percent. Applying the solutions from the 13-year retention optimization model, Table 45 illustrates the three different payment options in the proposed cafeteria-style bonus program, including: the total payout (not adjusted for the time value of money), the net present value (NPV) of the total payout, and the savings to the Navy (per individual SWO) realized using the third payment plan.

Table 45. Comparison of Payment Plans among Performance Tiers (Based on the Solution from the 13-year Retention Optimization Model)

Performance Tier	Payment Years	Current Payment Plan	Payment Plan 1	Payment Plan 2	Payment Plan 3
Tier 1	LCDR+2	\$22,000.00	\$22,000.00	\$16,212.92	\$42,570.41
	LCDR+3	\$12,000.00	\$13,012.13	\$16,212.92	\$0.00
	LCDR+4	\$12,000.00	\$13,012.13	\$16,212.92	\$0.00
	Total Payout	\$46,000.00	\$48,024.26	\$48,638.76	\$42,570.41
	NPV of Payments	\$43,696.22	\$45,526.17	\$45,526.17	\$42,570.41
Savings to Navy (per SWO)					\$2,955.76
Tier 2	LCDR+2	\$22,000.00	\$22,000.00	\$15,148.89	\$39,776.58
	LCDR+3	\$12,000.00	\$11,359.59	\$15,148.89	\$0.00
	LCDR+4	\$12,000.00	\$11,359.58	\$15,148.89	\$0.00
	Total Payout	\$46,000.00	\$44,719.17	\$45,446.67	\$39,776.58
	NPV of Payments	\$43,696.22	\$42,538.34	\$42,538.34	\$39,776.58
Savings to Navy (per SWO)					\$2,761.77
Tier 3	LCDR+2	\$22,000.00	\$22,000.00	\$13,372.77	\$35,113.00
	LCDR+3	\$12,000.00	\$8,601.12	\$13,372.77	\$0.00
	LCDR+4	\$12,000.00	\$8,601.11	\$13,372.77	\$0.00
	Total Payout	\$46,000.00	\$39,202.23	\$40,118.31	\$35,113.00
	NPV of Payments	\$43,696.22	\$37,550.97	\$37,550.97	\$35,113.00
Savings to Navy (per SWO)					\$2,437.97

Note: Savings to Navy = NPV of Optimal Payment - NPV of Payment under Payment Plan 3

Payment Plan 1 is structured to continue to pay SWOs \$22,000 during the initial installment, and the remainder of the bonus in two equal installments. Consideration is given so that the present value of all annual installments does not exceed the NPV of the total payout. On the other hand, Payment Plan 2 awards three equal payments. For each performance tier, the NPVs of the payment schemes for Payment Plans 1 and 2 are equivalent. However, when the 15-percent personal discount rate is applied to a single lump-sum payment, Payment Plan 3 yields a significantly lower NPV than the two other payment schemes. Payment Plan 3 provides a per-capita savings to the Navy of \$2,955.76 for tier-1 performers, \$2,761.77 for tier-2 performers, and \$2,437.97 for tier-3 performers. These cost savings are derived by comparing the NPV of Payment Plan 3 to the NPV of payments from Plan 1 (and Plan 2) based on the results from the 13-year optimization models. Therefore, in addition to providing an optimum composition

among tiers while staying within budget, the proposed cafeteria plan saves the Navy additional money for each SWO that elects the third payment plan.

To further illustrate the annual aggregate savings to the Navy, the following computation examines the annual net savings of implementing a cafeteria-style bonus program. According to Warner and Pleeter (2001), approximately 36.2 percent of O-4s with 12 years of service accepted a lump-sum separation payment rather than an annuity settlement for voluntary separations during the military drawdown period in the mid-1990s. This indicates more than one-third of the sub-sample possessed a significantly higher personal discount rate (in the magnitude of 19.6 percent). Using the distribution that 36.2 percent of the sub-sample will elect the larger up-front lump sum payment (corresponding to Payment Plan 3 in this study), Table 46 depicts an adjusted theoretical total cost to the Navy.

Table 46. Net Present Value (NPV) of Cost Calculations for the Cafeteria-style Bonus Program (Based on the Solution from the 13-year Retention Optimization Model)

Performance Tier	Total Retained	Total Electing Payment Plan 1 or 2	Total Electing Payment Plan 3	Total Cost of Plan 1 or 2 Takers	Total Cost of Payment Plan 3 Takers	Total Cost
Tier 1	81	52	29	\$2,497,261.63	\$1,234,541.83	\$3,731,803.47
Tier 2	112	71	41	\$3,020,222.16	\$1,630,839.58	\$4,651,061.74
Tier 3	0	0	0	\$0.00	\$0.00	\$0.00
Total	193	123	70	\$5,517,483.79	\$2,865,381.41	\$8,382,865.21

With a total cost of approximately \$8.38 million, the cafeteria bonus payment program yields a net savings of \$137,897.30 from the theoretical current budget situation (i.e., \$8,520,762.51). Similar savings are realized using the solutions from the optimization model that maximizes the bonus differential between tiers.

Comparable methodology is employed using the bonus payment scheme from the bonus differential optimization model. The proposed payment options are compared with the current payment plan in Table 47.

Table 47. Comparison of Payment Plans among Performance Tiers (Based on the Solution from the Bonus Differential Optimization Model)

Performance Tier	Payment Years	Current Payment Plan	Payment Plan 1	Payment Plan 2	Payment Plan 3
Tier 1	LCDR+2	\$22,000.00	\$22,000.00	\$17,115.35	\$44,939.93
	LCDR+3	\$12,000.00	\$14,413.68	\$17,115.35	\$0.00
	LCDR+4	\$12,000.00	\$14,413.69	\$17,115.35	\$0.00
	Total Payout	\$46,000.00	\$50,827.37	\$51,346.05	\$44,939.93
	NPV of Payments	\$43,696.22	\$48,060.20	\$48,060.20	\$44,939.93
	Savings to Navy (per SWO)				\$3,120.28
Tier 2	LCDR+2	\$22,000.00	\$22,000.00	\$14,412.78	\$37,843.76
	LCDR+3	\$12,000.00	\$10,216.35	\$14,412.78	\$0.00
	LCDR+4	\$12,000.00	\$10,216.35	\$14,412.78	\$0.00
	Total Payout	\$46,000.00	\$42,432.70	\$43,238.34	\$37,843.76
	NPV of Payments	\$43,696.22	\$40,471.35	\$40,471.35	\$37,843.76
	Savings to Navy (per SWO)				\$2,627.58
Tier 3	LCDR+2	\$22,000.00	\$22,000.00	\$13,372.77	\$35,113.00
	LCDR+3	\$12,000.00	\$8,601.12	\$13,372.77	\$0.00
	LCDR+4	\$12,000.00	\$8,601.11	\$13,372.77	\$0.00
	Total Payout	\$46,000.00	\$39,202.23	\$40,118.31	\$35,113.00
	NPV of Payments	\$43,696.22	\$37,550.97	\$37,550.97	\$35,113.00
	Savings to Navy (per SWO)				\$2,437.97

Note: Savings to Navy = NPV of Optimal Payment - NPV of Payment under Payment Plan 3

When compared to Payment Plans 1 and 2, Payment Plan 3 yields a per-capita savings to the Navy of \$3,120.28 for tier-1 performers, \$2,627.58 for tier-2 performers, and \$2,437.97 for tier-3 performers. Using the analogous distribution of 36.2 percent of the sub-sample electing Payment Plan 3, Table 48 depicts the theoretical total cost to the Navy based on the distribution of SWOs selecting each payment plan.

Table 48. Net Present Value (NPV) of Cost Calculations for the Cafeteria-style Bonus Program (Based on the Solution from the Bonus Differential Optimization Model)

Performance Tier	Total Retained	Total Taking Payment Plan 1 or 2	Total Taking Payment Plan 3	Total Cost of Plan 1 or 2 Takers	Total Cost of Payment Plan 3 Takers	Total Cost
Tier 1	81	52	29	\$2,643,023.09	\$1,303,257.87	\$3,946,280.96
Tier 2	112	71	41	\$2,873,465.72	\$1,551,594.34	\$4,425,060.07
Tier 3	0	0	0	\$0.00	\$0.00	\$0.00
Total	193	123	70	\$5,516,488.82	\$2,854,852.21	\$8,371,341.03

Akin to previous results from the 13-year retention optimization model, the cafeteria-style bonus plan (based on the values of the decision variables from the bonus differential optimization model) costs the Navy approximately \$8.37 million, while yielding a savings of \$149,421.48 when compared to the theoretical current budget situation (i.e., \$8,520,762.51). Regardless which optimization model the NPV of bonus payments is derived from, assuming that at least one SWO selects Payment Plan 3 each year, the Navy will realize annual net savings. Therefore, it would be in the best interests of the Navy to implement a cafeteria-style bonus program to capture value in the differential between the federal discount rate and personal discount rates among Surface Warfare Officers.

I. MODEL LIMITATIONS

1. Performance Tier Categories

Using a time-series dataset that covers 20 years, the methodology for creating performance tiers is dependent on the promotion time to Lieutenant Commander, which may fluctuate over the time period analyzed. Promotion to O-4 is dependent on promotion zones based on individual lineal numbers, and these zones vary over time. For example, in one fiscal year, SWOs with 9.5 YCS may be considered “in zone” for promotion purposes. While in a later fiscal year, SWOs with 9.5 YCS may be classified as “below zone.” This difference over time explains why approximately 35.16 percent of the SWO sample is categorized as tier-1 performers, who promoted between 9 and 10

YCS. If this categorization was based on the annual 10-percent cap on “below zone” promotions, the portion of the sample classified as tier-1 performers should be no more than 10 percent (Yardley et al., 2005). Furthermore, the proportion of tier-2 performers would be closer to 80 percent of the SWO sample to mirror “in zone” promotion probabilities, rather than 59.73 percent in this study. However, the bottom 5 percent of the sample is more accurately categorized into performance tier 3.

2. Econometric Models

The econometric models have two major limitations. First, fitness report (FITREP) data inaccessibility prevented performance analysis at earlier points in a SWO’s career—prior to promotion to Lieutenant Commander, or approximately 9 YCS. Ideally, FITREPs would provide performance data for earlier points of exit in the SWO career path. The inclusion of junior officer performance data would facilitate a more thorough analysis that examines the entire SWO career lifecycle to determine the optimal point at which to implement performance-based retention bonuses. To directly analyze the SWO community’s trouble with retaining the annual minimum requirement of 275 department heads, data on earlier performance indicators are required (Monroe & Cymrot, 2004).

Second, initial minimum service requirements (MSR) and the current active duty service obligation for each SWO were undefined in the DMDC dataset. Therefore, it is assumed that every SWO in the sample was not under an additional active duty service obligation at the 13-year point.²⁴ Additionally, all components of cash compensation for all years are used in the pay elasticity models. Ideally, if the MSR is known, the pay elasticity models should include compensation only after the initial obligation to exclude pay that did not influence retention decisions (since the officer was required to serve the entire obligation anyway).

²⁴ Additional active-duty service obligations can be incurred for attending a war college, pursuing a Navy-funded graduate degree, taking certain orders, laterally transferring to another officer community, filling a joint-duty billet, etc. Since SWO career paths are fluid beyond the required department head tours, these additional requirements can be incurred at almost any point in the later portion of a SWO's career.

3. Optimization Models

To create optimization models that predict optimal allocation of resources, several assumptions were made during calculations. Under the theoretical current situation, the available pool of 252 SWOs was extracted from the FY 2007 Lieutenant Commander promotion board results. Furthermore, the probability of categorization into a performance tier was derived from the descriptive statistics for the SWO sample contained in the DMDC dataset. As previously discussed, the categorization would normally correspond to promotion zone categories as established by the Secretary of the Navy. Additionally, this study applied personal discount rates (i.e., 15 percent) and the percentage of the sample that would elect the up-front lump-sum bonus payment (i.e., 36.2 percent) based on Warner and Pleeter's (2001) study. Though based on a published journal article, these assumptions are only proxies for the actual intentions of the SWOs captured in the DMDC dataset.

J. CHAPTER SUMMARY

The retention effects of adding a performance-based component to the Surface Warfare Officer Critical Skills Bonus were analyzed in this chapter. Using a sample of 1,331 Lieutenant Commander (O-4) SWOs, the researchers modeled the effect through econometric regression and optimization techniques.

By dividing the SWO sample into three performance tiers based on promotion time to O-4, differences in 13-year retention, quality characteristics, and pay elasticity were derived through econometric analysis. High performers were found to have higher 13-year retention rates than lower-performing counterparts. Additionally, as hypothesized, poor performers did not possess the quality characteristics desired by O-4 promotion boards, such as: graduate education, Joint Professional Military Education (JPME) completion, and holding command of a unit. Though these quality characteristics were statistically insignificant for high performers, average performers did possess many of these qualities. Furthermore, the pay elasticity of low performers was much higher than for higher-performing SWOs. Therefore, cash compensation motivates poor-performing SWOs more than average and higher performers. Finally, low

performers, as categorized at approximately 9 to 12 years of commissioned service (YCS), continued to show poor performance at later points in their careers, as evidenced by their abysmal Commander (O-5) promotion rate. These low performers add limited value to the SWO community, since they are ineligible for Commander Command and cannot retain past 20 YCS.

A hierarchical bonus structure was modeled by applying the performance tier differences as basic assumptions for optimizing the SWO Critical Skills Bonus. While staying within budget, the Navy could optimize the composition of the surface warfare community to yield a larger portion of high performers retained beyond 13 YCS, and achieve financial savings. Furthermore, improving overall retention (with higher retention of stellar performers) can be purchased with an additional cost above the current retention bonus expenditure. If the Navy desires to increase the overall 13-year SWO retention, a performance-based component to the SWO Critical Skills Bonus, coupled with an increased overall bonus budget, is a feasible solution.

Finally, adoption of a cafeteria-style bonus program can yield further savings for the SWO community, as it takes advantage of higher personal discount rates. By providing bonus payment plan options to eligible SWOs according to their respective performance tier, the Navy provides officers a freedom of choice while garnering additional savings to the Navy. Though cost savings are not the goal of the proposed change, these savings are a financial benefit beyond the considerable effect of increasing the overall performance level in the SWO community.

VII. SUMMARY, RECOMMENDATIONS AND CONCLUSIONS

A. SUMMARY

The purpose of this thesis was to develop a more efficient compensation system that would reward performance, improve Surface Warfare Officer retention in the mid-grade and senior officer ranks, and improve the overall quality of the SWO community. A performance-based component of the SWO Critical Skills Bonus accomplishes all three objectives. This study examined:

- Surface Warfare Officer retention
- Current policies and legislation affecting SWO compensation, performance evaluation, and promotion
- Performance and compensation theory
- Performance-based compensation in practice
- The retention effects of adding a performance-based component to the SWO Critical Skills Bonus.

In order “to get the right Sailor, with the right skills and experience, to the right place, at the right time, for the best value,” it is incumbent upon policymakers to improve business practices if they are not effectively achieving their intended results (Busch, 2006, p. 1). Thus, to change existing compensation vehicles and overcome severe mid-grade and senior officer shortages in the SWO community, Navy leadership must be willing to adjust existing compensation policy, to lobby for appropriate legislative steps to induce change, and to remove institutional barriers that are preventing required manning levels (Commander Naval Surface Forces, 2008b). The first section of this chapter addresses implementation of a performance-based component of the SWO Critical Skills Bonus. The second section summarizes this study’s conclusions. The final section presents future recommendations.

B. IMPLEMENTING A PERFORMANCE-BASED COMPONENT OF THE SURFACE WARFARE OFFICER CRITICAL SKILLS BONUS

1. Legislative, Policy, and Procedural Implications

US Code Title 37—Pay and Allowances of the Uniformed Services details payment authorization for Surface Warfare Officers (United States Code, 2004b). *Section 323* pertains to the Junior SWO Critical Skills Retention Bonus (CSRB) and the SWO Critical Skills Bonus. These bonuses provide “retention incentives for members [...] who [are] serving on active duty and [are] qualified in a designated critical military skill” (United States Code, 2004c, p. 1). *Section 323* specifically limits cumulative bonus awards to not exceed \$200,000 over a SWO’s career and restricts eligibility beyond 25 years of active duty service (United States Code, 2004c). Furthermore, *Section 319* authorizes Surface Warfare Officer Continuation Pay (SWOCP) to eligible SWOs upon obligating for the requisite department head tours (United States Code, 2004d). Retention bonus payments in excess of limits set by *Section 319* and *Section 323* must go through appropriate legislative measures to modify current payment authorization. Once approved through the annual *National Defense Authorization Act*, these funds can be distributed to eligible Surface Warfare Officers.

Retention policies stipulated in *NAVADMIN 012/06* (Junior SWO CRSB), *NAVADMIN 326/02* (SWO Critical Skills Bonus), and *NAVADMIN 259/04* (Senior CSRB) do not require significant revision to incorporate the addition of a performance-based component to existing retention bonuses (Chief of Naval Operations, 2005b; Navy Personnel Command, 2008a; Navy Personnel Command, 2008b). According to Commander Naval Surface Forces (2008b), a surplus exists in the junior SWO ranks through O-3 with 8 YCS; therefore, additional bonuses may not be warranted for junior officers. However, retention issues (i.e., manning shortages) first appear in the senior O-3 rank with 9 and 10 YCS. After a short reprieve due to a reduction in O-4 Officer Programmed Authorization (OPA) in the first two years at the O-4 level, the officer shortfall reappears at 13 YCS and continues through O-5 with 22 YCS. To capture a larger number of qualified SWOs at the mid-grade officer ranks while improving overall

quality of the SWO community through later years, this thesis targeted the \$46,000 SWO Critical Skills Bonus as the primary vehicle in which to introduce performance-based compensation.

Even though *Title 37 Section 323* limits the total cumulative retention bonus awards to \$200,000 per SWO over a full military career, most SWOs will not reach this maximum (United States Code, 2004c; Chief of Naval Operations, 2005b; Navy Personnel Command, 2008a; Navy Personnel Command, 2008b). Currently, retention bonuses amount to \$191,000 if Surface Warfare Officers receive the Junior SWO CSRB (\$25,000), SWOCP (\$50,000), the SWO Critical Skills Bonus (\$46,000), two years of Senior SWO CSRB at the O-5 level (\$15,000 per year), and two years of Senior SWO CSRB at the O-6 level (\$20,000 per year) (Chief of Naval Operations, 2005b; Navy Personnel Command, 2008a; Navy Personnel Command, 2008b).²⁵ Therefore, for SWOs who receive each retention bonus, there is approximately \$9,000 of flexibility written into *Title 37* if the Navy is to remain under the \$200,000 limit (United States Code, 2004c). Increased bonuses awarded earlier in a SWO's career may affect future bonus authorization without further modifications to current restrictions.

Department of Defense Directive (DoDD) 1304.21 sets DoD policy on critical skills retention bonuses (DoD, 2005b).

It is DoD policy that the Military Services use enlistment, accession, and reenlistment and retention bonuses as incentives in meeting DoD personnel requirements. The intent of bonuses is to influence personnel inventories in specific situations in which less costly methods have proven inadequate or impractical. The Military Services must exercise this authority in the most cost-effective manner, considering bonus employment in relation to overall skill, training, and utilization requirements. Military skills selected for the award of enlistment, accession, reenlistment, or retention bonuses must be essential to the accomplishment of defense missions. (DoD, 2005b, p. 2)

In setting forth policy, the Principal Deputy Under Secretary of Defense for Personnel and Readiness (PDUSD(P&R)) provides direction in the management of

²⁵ Senior SWOs may earn further Senior SWO CSRB payments dependent on the availability of (and appointment to) additional qualifying billets (CNO, 2004a).

retention bonuses with support from the Assistant Secretaries (Manpower and Reserve Affairs) of the specific military departments, who provide data pertaining to these skill areas (DoD, 2005b; DoD, 2004). In conjunction with recommending policy and budget guidance to the Secretary of Defense, PDUSD(P&R):

- Establishes criteria for designating military skills for the awards.
- Sets criteria for individual Service member eligibility for awards.
- Creates reporting and data requirements for periodic review and evaluation of bonus programs.
- Proposes revision to the DoD policy established by *DoDD 1304.21* and in accordance with applicable provisions of *US Code Title 37*.
- Monitors bonus programs of the Military Services and recommends to the Secretary of Defense measures required to attain the most efficient use of resources devoted to the programs.
- Reviews periodically (at least annually) the criteria for designation of military skills and makes revisions required to attain specific policy objectives.
- Evaluates and takes appropriate action on requests for exception to the criteria for designation of military skills (DoD, 2005b, p. 3).

Upon direction from PDUSD(P&R), the Secretary of the Navy (SECNAV) allocates funds approved by the Secretary of Defense to administer the bonus programs in accordance with *DoDD 1304.29, Administration of Enlistment Bonuses, Accession Bonuses for New Officers in Critical Skills, Selective Reenlistment Bonuses, and Critical Skills Retention Bonuses for Active Members* (DoD, 2005b). SECNAV has the responsibility to PDUSD(P&R) to recommend which military skill sets should be designated as critical skills. Additionally, SECNAV must annually review critical skills designations, provide program review data as requested, adjust criteria for designating military skills, and ensure that the bonus programs are sufficiently communicated to potential awardees. (DoD, 2005b)

DoDD 1304.29 also imposes an annual bonus limit of \$30,000, subject to change by PDUSD(P&R). Therefore, to modify the existing SWO Critical Skills Bonus,

SECNAV approval would be required; bonus increases that exceed the annual \$30,000 limit or the \$200,000 cumulative restriction will require a waiver from PDUSD(P&R). (DoD, 2005b; DoD, 2004)

2. Program Implementation

The direction set forth in *DoDD 1304.21* and *DoDD 1304.29* sufficiently addresses policy and administrative requirements to implement a performance-based component of the SWO Critical Skills Bonus. The largest administrative hurdle impeding successful implementation of a performance-based component to the SWO Critical Skills Bonus is the development of an appropriate and flexible process to categorize SWOs into performance tiers. A suitable program for setting the correct SWO Critical Skills Bonus levels for each performance tier is necessary to achieve OPA manning requirements.

This study used time to promote to Lieutenant Commander as a proxy for categorizing performance, which does not preclude applying other metrics in future implementation. Officers could be ranked on various measures of performance; however, promotion boards capture the “whole person” concept, evaluating much more than inflated performance apparent in FITREPs. Therefore, a similar peer review board that examines the whole service record may accurately evaluate and categorize performance.

By establishing an ineffective or inappropriate process of categorization, improperly weighing individual characteristics, or allocating an insufficient level of retention bonus payments, the Navy will only aggravate retention issues at the mid-grade and senior officer ranks. Since incorporating SWOCP in October 1999, the SWO Critical Skills Bonus in October 2002, the Senior SWO CSRB in 2004, and the Junior SWO CSRB in 2006, retention bonuses and continuation pay have not eliminated the shortage of mid-grade and senior level SWOs (Commander Naval Surface Forces, 2008b). This has created a situation in which “retention experience in the military skill is below designated retention objectives,” whereby quality SWOs are still leaving at an alarming rate (DoD, 2004, p. 15).

3. Predicted Cultural Resistance to Change

The US Office of Personnel Management (OPM) contends that the federal government must make significant changes to its compensation system in order “to recruit, manage, and retain the human capital” needed to meet today’s personnel challenges and those of the future (OPM, 2002, p. v). A performance-based component of the SWO Critical Skills Bonus provides a suitable vehicle for introducing pay for performance in the military. It provides a retention incentive while simultaneously encouraging increased quality in the Surface Warfare Officer community. Adapting lessons learned from select federal demonstration projects implementing performance-based compensation, some factors are equally important to the military sector of federal employment, such as:

- Providing pay commensurate with the quality of work
- Rewarding performance in a timely manner
- Linking performance and results-oriented behavior
- Promoting organizational goals (OPM, 2002).

Although survey data is somewhat biased, military surveys have identified shortcomings with existing military compensation (Summers, 1969; Messonnier, Bergstrom, Cornwell, Teasley, & Cordell, 2000). For example, the *August 2005 Status of Forces Survey of Active-Duty Members* only shows an overall 47-percent satisfaction level with military pay, while 85 percent of the sample reported that increased salary would improve their work-life balance (DMDC, 2006). Dissatisfaction with existing compensation practices presents an opportunity to employ compensation reform.

Implementation of performance-based compensation is contingent upon a change in current SWO retention bonus programs, which provide bonuses to nearly every SWO who meets minimum eligibility requirements. Ingrained in the SWO culture, these bonuses have become entitlements which compensate for additional service obligations. To combat this entitlement philosophy, the culture must recognize that quality performance should be rewarded, and poor performance must be discouraged. Additionally, the performance management system must:

- Support the performance-based component of the retention bonus program.
- Remove biases from the evaluation system.
- Provide sufficient training for supervisors and employees.
- Conduct constant program evaluation.
- Ensure proper funding (MSPB, 2006).

Implementing a compensation model that addresses retention and quality in the mid-grade officer ranks, a controversial deviation from the accepted standard in which bonuses quickly become entitlements, is not easily achieved through the hierarchical structure of the military organization. In addition to the lengthy approval process that involves several levels of the Navy's chain of command, buy-in by the SWO community is essential for the success (i.e., achieving intended results) and the longevity of performance-based compensation. Emotions, attitudes, and behavior affect the relationship SWOs have with their peers, with their command, and the SWO community (McShane & Von Glinow, 2007). Therefore, it is incumbent that "appropriate publicity campaigns [are conducted] to ensure that [...] service members are fully aware of the purpose and availability of bonuses and the individual eligibility criteria for award" (DoD, 2005b, p. 4). Only through a dutiful information and promotional campaign, which highlights the benefits to individual officers and the SWO community as a whole, can such a deeply ingrained compensation structure be changed.

Furthermore, as an institution, the Navy is deeply steeped in tradition (Builder, 1989).

Tradition has always been an important part of military life, but the Navy, much more than any of the other services, has cherished and clung to tradition [...] This reverence for tradition in the US Navy has continued right to the present, not just in pomp or display, but in the Navy's approach to almost every action from eating to fighting—from tooth to fang. (Builder, 1989, p. 18)

Tenure-based compensation, among the Navy's historic traditions, is an integral part of the Navy's culture. However, change is required to manage circumstances that have surfaced during the past few years, such as: the SWO manpower shortage in mid-

grade and senior officer ranks, continued heightened operational tempo associated with the ongoing Global War on Terrorism, and the high toll that Individual Augmentation and Global War on Terrorism Support Assignments have on sailors and their families. A performance-based alteration to the traditional Navy system of retention bonuses may be a feasible solution to combat the SWO inventory shortage. The Navy, as an “institution [...] marked by independence and stature,” may be willing to change its traditional compensation system, provided such change achieves the positive results presented in this study’s optimization models (Builder, 1989, p. 31).

Perhaps the most important step toward program implementation involves overcoming the resistance to changes falling outside of traditional boundaries. Organizational change is implemented through a three-stage change process introduced by Kurt Lewin, which is illustrated in Figure 38 (SHRM, 2007b).

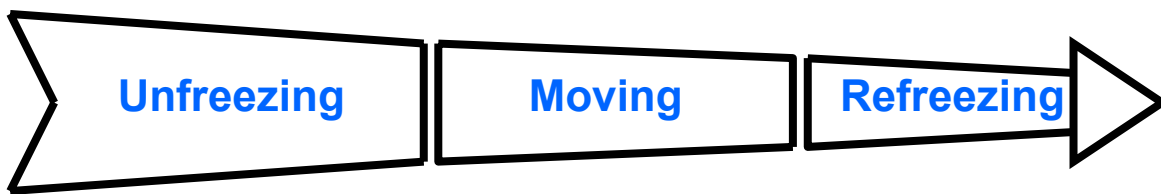


Figure 38. Stages of the Change Process
(Adapted from SHRM, 2007b, p. 3-38)

Proceeding from the current SWO retention bonus system to one that incorporates a performance-based component requires change, a process involving “unfreezing, moving, and refreezing” (SHRM, 2007b, p. 3-38; McShane & Von Glinow, 2007). “Unfreezing” is the first step that introduces change. The Surface Warfare Officer community must overcome impediments, “ending things that resist change” (SHRM, 2007b, p. 3-38). This step will require the Navy to break from the traditional philosophy that pay is an entitlement. Step two, “moving,” is the adjustment process during which the SWO community becomes acclimated to the new performance-based component of the SWO Critical Skills Bonus. During the “moving” phase, officers adapt to various leadership, management, and performance challenges that are introduced throughout the

process. During this stage, the informational campaign can dispel myths and indoctrinate officers to the changes in the bonus structure. Step three is the “refreezing” stage, in which change has been accepted as a regular component. This step requires buy-in from all levels of leadership in the Navy, particularly within the SWO community. (SHRM, 2007b)

Expanding beyond Lewin’s change model, “Lewin’s Force Field Analysis Model” (depicted in Figure 39) provides another perspective on the forces influencing the adoption of change (McShane & Von Glinow, 2007, p. 272).

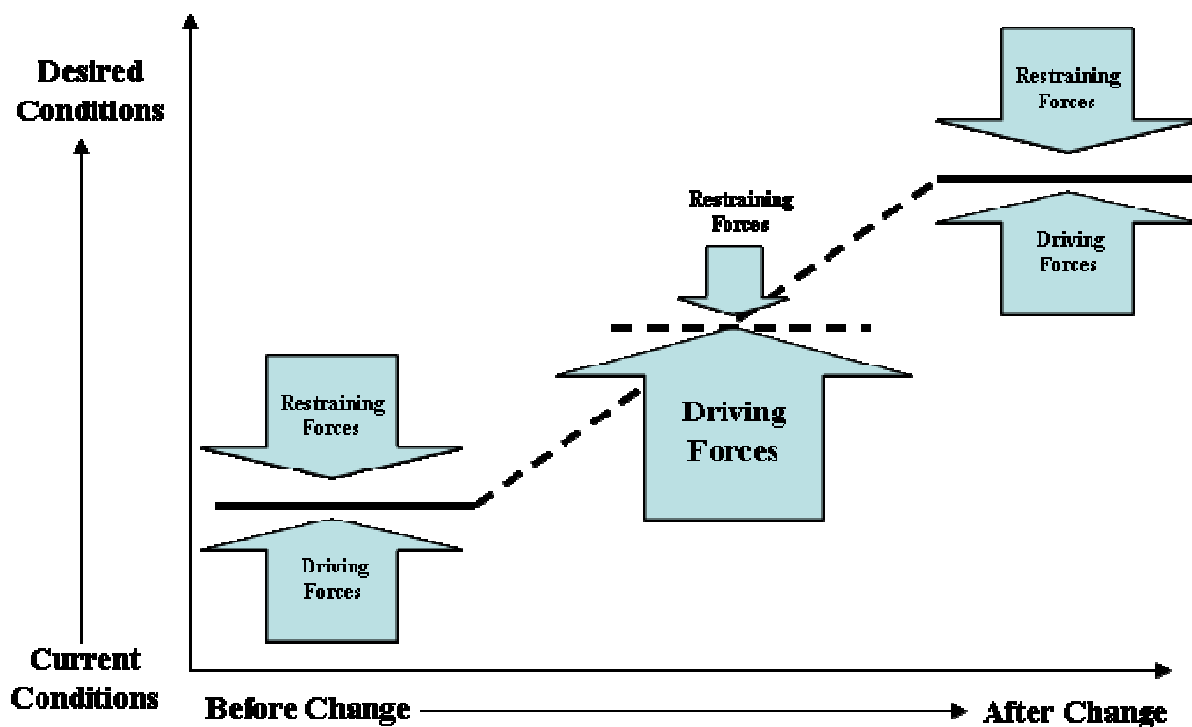


Figure 39. Lewin’s Force Field Analysis
(Adapted from McShane & Von Glinow, 2007, p. 272)

During this change process, “driving forces” are those dynamic activities that impel organization change, while “restraining forces” impede transformation (McShane & Von Glinow, 2007, p. 272). Static equilibrium conditions occur when “restraining forces” are equivalent to “driving forces,” while change occurs when these two forces are not in balance. When “driving forces” exceed “restraining forces,” change moves in the desired direction. Conversely, the opposite occurs when “restraining forces” exceed

“driving forces.” Commander Naval Surface Forces, SECNAV, and PDUSD(P&R) comprise influential military and civilian leadership positions capable of directing the process of implementing performance-based compensation. Top-down support and guidance (beyond issuing DoD Directives) develops the performance management system and facilitates the cultural change required to successfully implement a performance-based component to the Surface Warfare Officer Critical Skills Bonus. (McShane & Von Glinow, 2007)

4. Spillover Effects

a. Positive Spillover Effects

Implementing a performance-based component to the SWO Critical Skills Bonus has an immediate effect of rewarding higher-performing SWOs. Stellar performers benefit directly by earning higher retention bonus payments than lower-performing SWOs in the same rank. This system combats the relative flatness of military compensation at the O-4 rank between 11 and 16 YCS. Figure 40 depicts the annual basic pay as plotted by years of commissioned service based on the standard promotion timing plan, as published in *Department of Defense Instruction 1320.13* (Yardley et al., 2005).

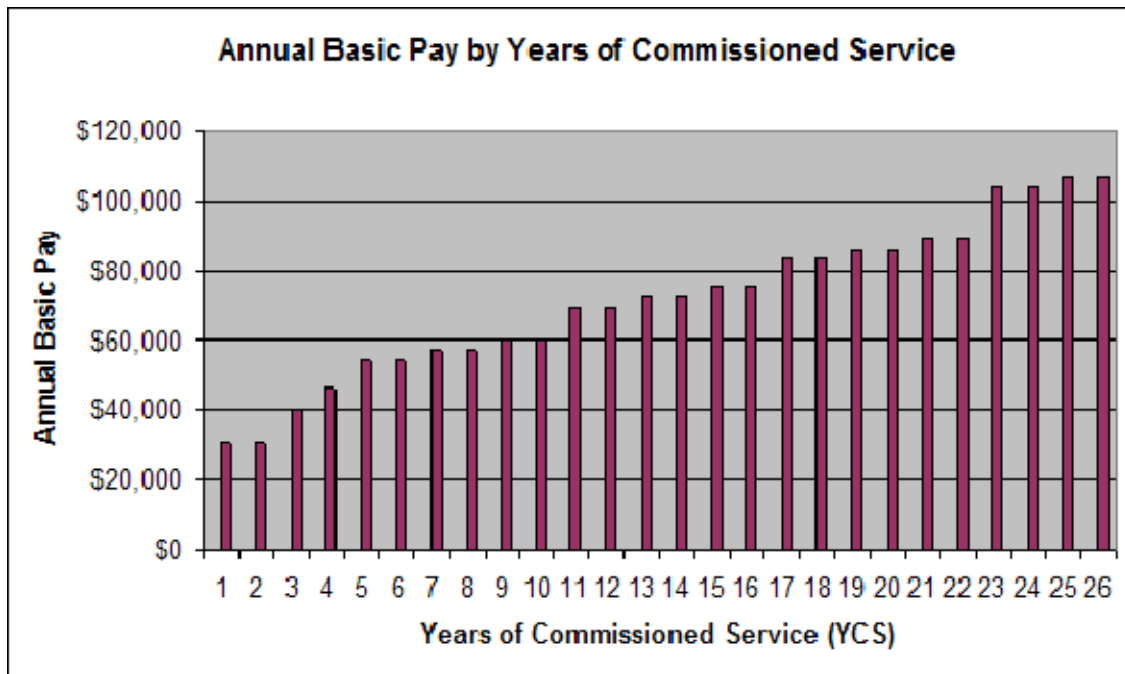


Figure 40. Annual Basic Pay by Years of Commissioned Service
(Adapted from Under Secretary of Defense for Personnel and Readiness, 2008a, p. 1)

By adding a performance-based component to the SWO Critical Skills Bonus, the resultant pay structure is adjusted by relative performance, thereby differentiating overall compensation based on observable performance. In the near-term, such a compensation program improves SWO retention in the mid-grade officer ranks and positively affects the overall quality of the SWO community. Extending into the more senior ranks (i.e., Commander), increased retention of high-performing SWOs provides a higher-quality force profile, with more competitive cohorts from which to select future warship and unit commanding officers (i.e., Commander Command).

Over a period of years, increased retention of mid-grade and senior officers reduces the requirement to maintain an extensive surplus of junior SWOs, particularly Ensigns through Lieutenants. Furthermore, higher retention at later years will require fewer SWO accessions to achieve the requisite O-4 and O-5 inventory. Thus, the Navy can realize additional savings in reduced accession costs by increasing 13-year retention through the revised retention bonus. The addition of a performance-based

component to the SWO Critical Skills Bonus not only saves money in the short-term, but may also reduce the current junior officer surplus and future accession costs (Commander Naval Surface Forces, 2008b).

Since categorization into performance tiers is based on time to promote to Lieutenant Commander (O-4), by modifying the SWO Critical Skills Bonus to include a performance-based component, the Navy will provide an incentive for junior Surface Warfare Officers to increase on-the-job performance earlier in their careers. SWOs are provided with a financial incentive to improve their overall service record through graduate education, JPME completion, additional qualifications, subspecialty codes, and early command opportunities. This spillover effect will increase the overall quality of the SWO community, as these better-educated and more-qualified officers will add higher value to the Navy. The increased quality of junior SWOs will extend to improve the quality of mid-grade officers, who eventually promote to Commander at a higher rate than their lower-performing counterparts.

b. Negative Spillover Effects

Poor-performing SWOs are likely to strongly oppose the addition of a performance-based component to the SWO Critical Skills Bonus. Since they are currently performing worse than their peers and are promoting more slowly, their retention bonus payment opportunity is significantly reduced under the compensation modifications. Their motivation may further decrease after being classified as lower performers, further reducing on-the-job performance. However, if they realize early that they are on a path to lower pay, these poor performers may improve their performance and attempt to improve the quality of their service records by investing in additional human capital to boost their professional competitiveness.

Furthermore, promotion to Lieutenant Commander is highly dependent on the quality of fitness reports (FITREPs) in an officer's service record. Particularly, recent FITREPs are weighted more heavily during promotion board deliberations. A poor O-3 FITREP received closer to the O-4 promotion board could significantly reduce the resultant O-4 promotion probability. If the bad FITREP was a result of a disagreement

between the officer and the commanding officer (or reporting senior) and not specifically due to poor performance, then this FITREP will not fairly represent that officer during the promotion board. Unfortunately, there is limited recourse to handle this situation under current policy. This spillover effect may be further exacerbated with the implementation of performance-based compensation.

Finally, based on the tier characteristics econometric models, minority groups may be underrepresented in performance tier 1, particularly African Americans and SWOs who classify their race and ethnicity as “other.” Moreover, officers categorized as “other” race and ethnicity are more likely to be classified as tier-3 performers; indeed, these SWOs are overrepresented in tier 3. Though unintended, this phenomenon may adversely impact diversity, especially if there is a systematic difference in retention bonus payouts among race and ethnicity groups.

C. CONCLUSIONS

Extensive literature supports the difficulty the Navy has maintaining its Surface Warfare Officers in the mid-grade level and at later stages of their careers. Due to the single port of entry in the SWO community at the time of commissioning, future warship commanding officers (serving in Commander Command billets) are selected from an officer pool that accessed as Ensigns (O-1) more than 15 years prior. This finite officer corps is severely impacted by retention decisions along the typical SWO career path, including the following influencers:

- The appeal of civilian job market opportunities compared to the Navy’s relatively flat pay structure
- A bureaucratic promotion system with restrictive promotion opportunities in the mid-grade and senior officer ranks
- Numerous and long deployment cycles
- Changing job requirements (i.e., Individual Augmentation assignments and Global War on Terrorism Support Assignments)
- The dangerous nature of naval warfare and the shipboard environment.

These decision variables influence a complex internal labor market, in which retaining the highest-quality officers becomes increasingly difficult. Higher-performing

SWOs also have the best opportunities in the civilian sector; while the military's traditional pay system that provides equal pay, allowances, and bonuses (for all who meet minimum eligibility) offers little financial reward to acknowledge their exemplary efforts. Furthermore, the current compensation structure provides limited incentive to increase the overall quality of the surface warfare community.

Adding a performance-based component to the Surface Warfare Officer Critical Skills Bonus provides the most logical vehicle to influence quality and retention in the SWO community. Targeting the retention shortage between 13 to 16 YCS generates positive spillover effects on either side of the implementation period (i.e., before 13 YCS and after 16 YCS) and will provide long-term benefits to the SWO community. However, to combat potential cultural resistance to the change, implementation will require an extensive investment in planning and training to ensure that the program is thoroughly communicated to the SWO community and that necessary processes are incorporated across all performance-management levels.

This thesis validated the benefits of adding a performance-based component to the SWO Critical Skills Bonus. This component creates a hierarchical payout in which higher performers earn a larger retention bonus than average performers, who earn more than lower performers. The significance of adding performance-based compensation in the SWO community includes:

- Increased 13-year retention among higher-performing SWOs
- Improved quality of the SWO community
- Higher promotion rate to Commander (O-5) based on increased 13-year retention of high-performing SWOs
- Better person-job matches among high performers compared to lower-performing peers.

The Navy can achieve these benefits while remaining within the existing budget for the SWO Critical Skills Bonus program. Furthermore, the composition of the SWO community and retention through 13 YCS can be further improved if the SWO community would be willing to relax future budget constraints and allot more resources

to the program. Lastly, taking advantage of higher personal discount rates, a cafeteria-style bonus payout program can generate additional savings for the Navy.

D. RECOMMENDATIONS

1. Adding a Performance-based Component to the SWO Critical Skills Bonus

Retaining larger numbers of high performers increases the quality of the SWO community and reduces dysfunctional turnover. Therefore, it is imperative that the SWO community's retention bonus programs target these top performers. Conversely, functional turnover should be encouraged—in which poor-performing SWOs are enticed to leave the service prematurely by reducing existing retention bonus payments. The results from the bonus differential optimization model fulfill both needs and provide the optimal solution, in which retention of high performing SWOs is maximized. Additionally, a small annual savings is realized by the Navy, which compounds annually to yield substantial savings over the lifespan of the bonus program. It is recommended the Navy add a three-tier performance-based component to the Surface Warfare Officer Critical Skills Bonus and utilize only the three-year obligation option. Since the one-year obligation provides little guarantee of a long-term commitment, this short-term plan does little to improve SWO retention and should be terminated.

To accurately categorize Lieutenant Commander (O-4) cohorts into three performance tiers, this study recommends that the SWO community integrate a SWO Tier Performance Review Board into the annual O-4 promotion board, creating a peer-reviewed performance management system for performance-based compensation. Using the “whole person” concept, this performance review board will evaluate the complete service record to more accurately categorize performance. Establishing tiers with this process extends beyond utilizing a metric based on a single indicator of performance, such as Fitness Reports, graduate education, or completion of Joint Professional Military Education.

This board would establish annual performance tier cutoffs, categorizing new O-4 selectees into appropriate tiers. In accordance with the results of this study, the current recommendation is to categorize the top 35 percent into performance tier 1, the following 60 percent into tier 2, and the bottom 5 percent into performance tier 3. Through the new performance-based component, bonus payments should be set accordingly to maximize the retention of tier-1 performers.

2. Cafeteria-style Payment Program

A cafeteria-style payment program should be added to the SWO Critical Skills Bonus. Incorporation of higher personal discount rates among Surface Warfare Officers into a bonus option—which provides a larger up-front lump-sum payment—will yield further savings to the Navy for each officer electing this alternative. A cafeteria-style bonus program can generate significant savings for the SWO community while providing individual officers (within their respective performance tier) the freedom to choose which option best suits their needs.

3. Recommendations for Further Research

This thesis provided a thorough analysis of Surface Warfare Officer retention and performance-based compensation. However, further research could expand the study to include other important aspects of the SWO community, such as an analysis of earlier ports of exit (prior to 13 YCS) and the effect of performance-based compensation on SWO culture.

a. Analysis at Earlier Ports of Exit in the Junior SWO Ranks

This thesis focused analysis on SWO retention at the 13-year port of exit, with emphasis on the corresponding SWO Critical Skills Bonus. Further analysis at earlier ports of exit is essential if policymakers are to determine the most optimal point along the SWO career path at which to implement performance-based compensation. Retaining at least 275 Lieutenant SWOs for department head tours is essential to the operational success of the surface Navy (Monroe & Cymrot, 2004). The retention

bonuses (i.e., Surface Warfare Officer Continuation Pay and Junior SWO Critical Skills Retention Bonus) offered at this port of exit should be studied. To effectively study the influence of these bonuses in the junior officer ranks, researchers must have access to FITREP data. FITREPs provide a fairly accurate performance indicator for more junior SWOs. Therefore, it is recommended that a follow-on study acquire SWO FITREP data and analyze the retention effect of adding a performance-based component to the SWOCP and Junior SWO CSRB.

b. Cultural Climate Analysis of the Surface Warfare Community

Prior to adding a performance-based component to the SWO Critical Skills Bonus, the Navy should conduct a cultural climate analysis to determine fleet sentiment toward performance-based compensation. The recommended change to the bonus is incongruent with current SWO compensation philosophy—whereby retention bonuses have become entitlements, contingent upon incurring an additional active-duty obligation and void of any performance-based component. Consequently, a SWO community survey may be necessary to gauge the potential cultural impact of implementing a performance-based component to the SWO Critical Skills Bonus.

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APPENDIX A. FY 2008 MONTHLY BASIC PAY TABLE

EFFECTIVE 1 JANUARY 2008

PAY GRADE	YEARS OF SERVICE																							
	COMMISSIONED OFFICERS																							
	<2	2	3	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40		
O-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14137.20	14206.20	14349.90	14349.90	14349.90	14349.90	14349.90	14349.90	14349.90	14349.90	14349.90		
O-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12364.80	12542.70	12800.10	13249.20	13249.20	13911.90	13911.90	14349.90	14349.90	14349.90	14349.90		
O-8	8748.90	9035.10	9225.60	9278.70	9516.00	9912.30	10004.70	10381.20	10488.90	10813.50	11282.40	11715.30	12004.20	12004.20	12004.20	12004.20	12304.50	12304.50	12612.30	12612.30	12612.30	12612.30		
O-7	7269.60	7607.40	7763.70	7887.90	8112.60	8334.90	8591.70	8847.90	9105.00	9912.30	10594.20	10594.20	10594.20	10594.20	10647.90	10647.90	10860.90	10860.90	10860.90	10860.90	10860.90	10860.90		
O-6	5388.30	5919.30	6307.80	6307.80	6331.80	6603.30	6639.00	6639.00	7016.40	7683.60	8075.10	8466.30	8688.90	8914.50	9351.90	9351.90	9538.80	9538.80	9538.80	9538.80	9538.80	9538.80		
O-5	4491.60	5059.80	5410.50	5476.20	5694.60	5825.70	6113.10	6324.00	6596.40	7013.70	7212.00	7408.50	7631.10	7631.10	7631.10	7631.10	7631.10	7631.10	7631.10	7631.10	7631.10	7631.10		
O-4	3875.70	4498.50	4795.60	4852.50	5130.30	5428.20	5799.00	6089.20	6288.90	6404.10	6471.00	6471.00	6471.00	6471.00	6471.00	6471.00	6471.00	6471.00	6471.00	6471.00	6471.00	6471.00		
O-3	3407.40	3882.80	4169.40	4545.60	4763.10	5002.20	5157.00	5411.40	5543.40	5543.40	5543.40	5543.40	5543.40	5543.40	5543.40	5543.40	5543.40	5543.40	5543.40	5543.40	5543.40	5543.40		
O-2	2943.90	3353.10	3661.90	3892.40	4074.30	4074.30	4074.30	4074.30	4074.30	4074.30	4074.30	4074.30	4074.30	4074.30	4074.30	4074.30	4074.30	4074.30	4074.30	4074.30	4074.30	4074.30		
O-1	2555.70	2659.80	3215.10	3215.10	3215.10	3215.10	3215.10	3215.10	3215.10	3215.10	3215.10	3215.10	3215.10	3215.10	3215.10	3215.10	3215.10	3215.10	3215.10	3215.10	3215.10	3215.10		
COMMISSIONED OFFICERS WITH OVER 4 YEARS ACTIVE DUTY SERVICE AS AN ENLISTED MEMBER OR WARRANT OFFICER																								
O-3E	0.00	0.00	0.00	0.00	4545.60	4763.10	5002.20	5157.00	5411.40	5625.60	5748.60	5916.00	5916.00	5916.00	5916.00	5916.00	5916.00	5916.00	5916.00	5916.00	5916.00	5916.00		
O-2E	0.00	0.00	0.00	0.00	3892.40	4074.30	4204.20	4423.20	4592.40	4718.40	4718.40	4718.40	4718.40	4718.40	4718.40	4718.40	4718.40	4718.40	4718.40	4718.40	4718.40	4718.40		
O-1E	0.00	0.00	0.00	0.00	3215.10	3433.80	3560.40	3690.30	3817.80	3892.40	3992.40	3992.40	3992.40	3992.40	3992.40	3992.40	3992.40	3992.40	3992.40	3992.40	3992.40	3992.40		
WARRANT OFFICERS																								
W-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6261.30	6579.00	6815.40	7077.60	7077.60	7431.60	7431.60	7803.30	7803.30	8193.60	8193.60		
W-4	3521.10	3788.10	3886.70	4003.80	4188.00	4370.10	4554.60	4832.70	5076.00	5307.60	5486.90	5681.70	5953.50	6176.40	6431.10	6431.10	6559.50	6559.50	6559.50	6559.50	6559.50	6559.50		
W-3	3215.40	3349.80	3486.90	3532.20	3676.20	3859.70	4254.90	4383.80	4554.30	4719.90	5017.50	5218.80	5338.10	5466.90	5640.90	5640.90	5640.90	5640.90	5640.90	5640.90	5640.90	5640.90		
W-2	2845.50	3114.60	3197.40	3254.70	3439.20	3726.00	3867.90	4008.00	4179.00	4312.50	4434.00	4578.60	4674.00	4749.90	4749.90	4749.90	4749.90	4749.90	4749.90	4749.90	4749.90	4749.90		
W-1	2497.80	2769.00	2838.90	2991.60	3172.50	3438.60	3562.80	3736.50	3907.50	4041.90	4165.50	4316.10	4316.10	4316.10	4316.10	4316.10	4316.10	4316.10	4316.10	4316.10	4316.10	4316.10		
ENLISTED MEMBERS																								
E-9	0.00	0.00	0.00	0.00	0.00	0.00	4254.60	4350.90	4472.40	4615.50	4759.20	4990.50	5185.80	5391.60	5705.70	5705.70	5991.00	5991.00	6290.70	6290.70	6605.40	6605.40		
E-8	0.00	0.00	0.00	0.00	0.00	3482.70	3636.90	3732.30	3846.60	3970.20	4193.70	4306.80	4498.40	4606.20	4869.60	4869.60	4967.10	4967.10	4967.10	4967.10	4967.10	4967.10		
E-7	2421.00	2642.40	2743.50	2877.90	2992.30	3162.00	3263.10	3443.10	3592.50	3694.50	3803.10	3945.40	3986.70	4062.60	4351.20	4351.20	4351.20	4351.20	4351.20	4351.20	4351.20	4351.20		
E-6	2094.00	2304.00	2405.70	2504.40	2607.60	2840.10	2930.40	3105.00	3158.70	3197.70	3243.30	3243.30	3243.30	3243.30	3243.30	3243.30	3243.30	3243.30	3243.30	3243.30	3243.30	3243.30		
E-5	1918.80	2047.20	2145.90	2247.30	2405.10	2570.70	2705.40	2722.20	2722.20	2722.20	2722.20	2722.20	2722.20	2722.20	2722.20	2722.20	2722.20	2722.20	2722.20	2722.20	2722.20	2722.20		
E-4	1758.90	1849.90	1949.10	2047.80	2135.10	2135.10	2135.10	2135.10	2135.10	2135.10	2135.10	2135.10	2135.10	2135.10	2135.10	2135.10	2135.10	2135.10	2135.10	2135.10	2135.10	2135.10		
E-3	1587.90	1687.80	1789.80	1789.80	1789.80	1789.80	1789.80	1789.80	1789.80	1789.80	1789.80	1789.80	1789.80	1789.80	1789.80	1789.80	1789.80	1789.80	1789.80	1789.80	1789.80	1789.80		
E-2	1509.90	1509.90	1509.90	1509.90	1509.90	1509.90	1509.90	1509.90	1509.90	1509.90	1509.90	1509.90	1509.90	1509.90	1509.90	1509.90	1509.90	1509.90	1509.90	1509.90	1509.90	1509.90		
E-1 >4 Mon	1347.00	1347.00	1347.00	1347.00	1347.00	1347.00	1347.00	1347.00	1347.00	1347.00	1347.00	1347.00	1347.00	1347.00	1347.00	1347.00	1347.00	1347.00	1347.00	1347.00	1347.00	1347.00		
E-1 <4 Mon	1245.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
C/S	18601.20	M/S		6875.10																				

E-1 < 4 refers to members who have served less than 4 months on active duty.
FY2008, 3.5% Pay Raise Increase. Public Law No 110-181 National Defense Auth Act.
signed into law on January 28, 2008.

NOTE-BASIC PAY FOR O7-O10 IS LIMITED TO LEVEL II OF THE EXECUTIVE SCHEDULE (\$14,349.90)
NOTE-BASIC PAY FOR O6 AND BELOW IS LIMITED TO LEVEL V OF THE EXECUTIVE SCHEDULE (\$11,833.40)

(Under Secretary of Defense for Personnel and Readiness, 2008a, p. 1)

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APPENDIX B. NAVAL OFFICER FITREP (NAVPERS 1610/2)

FITNESS REPORT & COUNSELING RECORD (E7 - O6)

RCS BUPERS 1610-1

1. Name (Last, First MI Suffix)				2. Grade/Rate		3. Desig		4. SSN	
5. ACT <input type="checkbox"/>		TAR <input type="checkbox"/>		INACT <input type="checkbox"/>		AT/ADSW/265 <input type="checkbox"/>		6. UIC	
7. Ship/Station				8. Promotion Status		9. Date Reported			
Occasion for Report				Period of Report					
10. Periodic <input type="checkbox"/>		11. Detachment of Individual <input type="checkbox"/>		12. Detachment of Reporting Senior <input type="checkbox"/>		13. Special <input type="checkbox"/>		14. From: To:	
16. Not Observed Report <input type="checkbox"/>		Type of Report		17. Regular <input type="checkbox"/>		18. Concurrent <input type="checkbox"/>		19. Ops Cdr <input type="checkbox"/>	
20. Physical Readiness				21. Billet Subcategory (if any)					
22. Reporting Senior (Last, FI MI)				23. Grade		24. Desig		25. Title	
				26. UIC		27. SSN			
28. Command employment and command achievements.									
29. Primary/Collateral/Watchstanding duties. (Enter primary duty abbreviation in box.)									
<div style="border: 1px solid black; height: 20px; width: 100%;"></div>									
For Mid-term Counseling Use. (When completing FITREP enter 30 and 31 from counseling worksheet sign 32.)				30. Date Counseled		31. Counselor		32. Signature of Individual Counseled	
PERFORMANCE TRAITS: 1.0 - Below standards/not progressing or UNSAT in any one standard; 2.0 - Does not yet meet all 3.0 standards; 3.0 - Meets all 3.0 standards; 4.0 - Exceeds most 3.0 standards; 5.0 - Meets overall criteria and most of the specific standards for 5.0. Standards are not all inclusive.									
PERFORMANCE TRAITS		1.0* Below Standards		2.0 Pro-gressing		3.0 Meets Standards		4.0 Above Standards	
								5.0 Greatly Exceeds Standards	
33. PROFESSIONAL EXPERTISE: Professional knowledge, proficiency, and qualifications.		- Lacks basic professional knowledge to perform effectively. - Cannot apply basic skills. - Fails to develop professionally or achieve timely qualifications.		- - -		- Has thorough professional knowledge. - Competently performs both routine and new tasks. - Steadily improves skills, achieves timely qualifications.		- - -	
NOB <input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
34. COMMAND OR ORGANIZATIONAL CLIMATE/EQUAL OPPORTUNITY: Contributing to growth and development, human worth, community.		- Actions counter to Navy's retention/reenlistment goals. - Uninvolved with mentoring or professional development of subordinates. - Actions counter to good order and discipline and negatively affect Command/Organizational climate. - Demonstrates exclusionary behavior. Fails to value differences from cultural diversity.		- - -		- Positive leadership supports Navy's increased retention goals. Active in decreasing attrition. - Actions adequately encourage/support subordinates' personal/professional growth. - Demonstrates appreciation for contributions of Navy personnel. Positive influence on Command climate. - Values differences as strengths. Fosters atmosphere of acceptance/inclusion per EO/EEC policy.		- - -	
NOB <input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
35. MILITARY BEARING/ CHARACTER: Appearance, conduct, physical fitness, adherence to Navy Core Values.		- Consistently unsatisfactory appearance. - Unsatisfactory demeanor or conduct. - Unable to meet one or more physical readiness standards. - Fails to live up to one or more Navy Core Values: HONOR, COURAGE, COMMITMENT.		- - -		- Excellent personal appearance. - Excellent demeanor or conduct. - Complies with physical readiness program. - Always lives up to Navy Core Values: HONOR, COURAGE, COMMITMENT.		- - -	
NOB <input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
36. TEAMWORK: Contributions towards team building and team results.		- Creates conflict, unwilling to work with others, puts self above team. - Fails to understand team goals or teamwork techniques. - Does not take direction well.		- - -		- Reinforces others' efforts, meets personal commitments to team. - Understands team goals, employs good teamwork techniques. - Accepts and offers team direction.		- - -	
NOB <input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
37. MISSION ACCOMPLISHMENT AND INITIATIVE: Taking initiative, planning/prioritizing, achieving mission.		- Lacks initiative. - Unable to plan or prioritize. - Does not maintain readiness. - Fails to get the job done.		- - -		- Takes initiative to meet goals. - Plans/prioritizes effectively. - Maintains high state of readiness. - Always gets the job done.		- - -	
NOB <input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	

NAVPERS 1610/2 (Rev. 3-02)

FITNESS REPORT & COUNSELING RECORD (E7 - O6) (cont'd)

RCS BUPERS 1610-1

1. Name (Last, First MI Suffix)		2. Grade/Rate		3. Desig		4. SSN	
PERFORMANCE TRAITS		1.0* Below Standards		2.0 Pro- gressing		3.0 Meets Standards	
4.0 Above Standards		5.0 Greatly Exceeds Standards					
38. LEADERSHIP: Organizing, motivating and developing others to accomplish goals.		- Neglects growth/development or welfare of subordinates. - Fails to organize, creates problems for subordinates. - Does not set or achieve goals relevant to command mission and vision. - Lacks ability to cope with or tolerate stress. - Inadequate communicator. - Tolerates hazards or unsafe practices.		- - - - - - -		- Effectively stimulates growth/development in subordinates. - Organizes successfully implementing process improvements and efficiencies. - Sets/achieves useful, realistic goals that support command mission. - Performs well in stressful situations. - Clear, timely communicator. - Ensures safety of personnel and equipment.	
NOB <input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
39. TACTICAL PERFORMANCE: (Warfare qualified officers only) Basic and tactical employment of weapons systems.		- Has difficulty attaining qualifications expected for rank and experience. - Has difficulty in ship(s), aircraft or weapons systems employment. - Below others in knowledge and employment. - Warfare skills in specialty are below standards compared to others of same rank and experience.		- - - -		- Attains qualifications as required and expected. - Capably employs ship(s), aircraft, or weapons systems. Equal to others in warfare knowledge and employment. - Warfare skills in specialty equal to others of same rank and experience.	
NOB <input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
40. I recommend screening this individual for next career milestone(s) as follows: (maximum of two) Recommendations may be for competitive schools or duty assignments such as: LCPO, DEPT CPO, SEA, CMC, CWO, LDO, Dept Head, XO, OIC, CO, Major Command, War College, PG School.							
41. COMMENTS ON PERFORMANCE. * All 1.0 marks, three 2.0 marks, and 2.0 marks in Block 34 must be specifically substantiated in comments. Comments must be verifiable. Font must be 10 or 12 pitch (10 to 12 point) only. Use upper and lower case.							
Promotion Recommendation		NOB	Significant Problems	Progressing	Promotable	Must Promote	Early Promote
42. INDIVIDUAL							
43. SUMMARY							
45. Signature of Reporting Senior				46. Signature of individual evaluated. * I have seen this report, been apprised of my performance, and understand my right to make a statement.			
Date:				I intend to submit a statement <input type="checkbox"/> do not intend to submit a statement <input type="checkbox"/>			
Member Trait Average:		Summary Group Average:		Date:			
47. Typed name, grade, command, UIC, and signature of Regular Reporting Senior on Concurrent Report							
Date:							

APPENDIX C. PAY ELASTICITY REGRESSION MODELS FOR TIER-1 PERFORMERS

Variables	(1) LPM, Robust SE	(2) Probit Model	(3) Partial Effects from Probit Model
Dependent Variable	<i>retention13yr</i>	<i>retention13yr</i>	<i>retention13yr</i>
<i>age</i>	-0.0114 (0.0036)***	-0.0441 (0.0199)**	-0.0113 (0.0051)**
<i>dependents</i>	0.0393 (0.0047)***	0.2168 (0.0284)***	0.0555 (0.0071)***
<i>prienlist</i>	0.1151 (0.0199)***	0.3602 (0.1329)***	0.0825 (0.0270)***
<i>female</i>	0.2638 (0.0186)***		
<i>amerindian</i>	0.0502 (0.0159)***		
<i>asian</i>	-0.8508 (0.0233)***		
<i>black</i>	-0.0431 (0.0261)*	-0.1785 (0.1224)	-0.0489 (0.0357)
<i>hispanic</i>	-0.0066 (0.0434)	-0.1431 (0.1610)	-0.0389 (0.0462)
<i>other</i>	0.0000 (0.0000)		
<i>married</i>	0.0835 (0.0245)***	0.2080 (0.0920)**	0.0568 (0.0268)**
<i>masters</i>	0.0661 (0.0132)***	0.2945 (0.0712)***	0.0716 (0.0163)***
<i>postmasters</i>	0.0000 (0.0000)		
<i>JPMEph1</i>	0.0999 (0.0132)***		
<i>JPMEph2</i>	0.0000 (0.0000)		
<i>OCS</i>	0.0337 (0.0163)**	0.1638 (0.0734)**	0.0412 (0.0181)**
<i>othercomm</i>	0.1677 (0.0198)***		
<i>command</i>	0.1586 (0.0091)***		
<i>lpay</i>	0.0151 (0.0023)***	0.0606 (0.0083)***	0.0155 (0.0021)***
<i>y2005</i>	-0.0094 (0.0362)	-0.0416 (0.2011)	-0.0108 (0.0533)
<i>y2004</i>	-0.0167 (0.0360)	-0.0688 (0.2019)	-0.0181 (0.0547)
<i>y2003</i>	-0.0200 (0.0363)	-0.0997 (0.2012)	-0.0266 (0.0558)
<i>y2002</i>	-0.0194 (0.0363)	-0.1014 (0.2012)	-0.0271 (0.0559)

y2001	-0.0184 (0.0363)	-0.0976 (0.2011)	-0.0260 (0.0557)
y2000	-0.0179 (0.0363)	-0.0977 (0.2012)	-0.0260 (0.0557)
y1999	-0.0192 (0.0366)	-0.1195 (0.2006)	-0.0321 (0.0565)
y1998	-0.0207 (0.0369)	-0.1406 (0.2001)	-0.0381 (0.0572)
y1997	-0.0210 (0.0370)	-0.1461 (0.1999)	-0.0397 (0.0574)
y1996	0.0055 (0.0376)	-0.0355 (0.1990)	-0.0092 (0.0525)
y1995	-0.0183 (0.0370)	-0.1341 (0.1997)	-0.0363 (0.0569)
y1994	-0.0158 (0.0370)	-0.1272 (0.1996)	-0.0343 (0.0565)
y1993	-0.0167 (0.0373)	-0.1378 (0.1992)	-0.0373 (0.0568)
y1992	0.0142 (0.0382)	0.0283 (0.1984)	0.0072 (0.0496)
y1991	0.0388 (0.0389)	0.1289 (0.1994)	0.0312 (0.0455)
y1990	0.0588 (0.0403)	0.2045 (0.1997)	0.0478 (0.0423)
y1989	0.0707 (0.0406)*	0.2392 (0.2007)	0.0550 (0.0410)
y1988	0.0846 (0.0415)**	0.2939 (0.2013)	0.0659 (0.0388)*
y1987	0.0927 (0.0416)**	0.3268 (0.2026)	0.0721 (0.0377)*
Constant	0.7215 (0.0907)***	0.5692 (0.4850)	
Observations	3100	2320	2320
R-squared	0.17		
Notes: Standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%			

APPENDIX D. PAY ELASTICITY REGRESSION MODELS FOR TIER-2 PERFORMERS

Variables	(1) LPM, Robust SE	(2) Probit Model	(3) Partial Effects from Probit Model
Dependent Variable	<i>retention13yr</i>	<i>retention13yr</i>	<i>retention13yr</i>
<i>age</i>	-0.0037 (0.0021)*	-0.0172 (0.0079)**	-0.0048 (0.0022)**
<i>dependents</i>	0.0359 (0.0028)***	0.1438 (0.0111)***	0.0404 (0.0031)***
<i>prienlist</i>	0.0141 (0.0137)	0.0681 (0.0540)	0.0187 (0.0146)
<i>female</i>	0.1039 (0.0208)***	0.3916 (0.0895)***	0.0924 (0.0172)***
<i>amerindian</i>	-0.3957 (0.0786)***	-1.2666 (0.2062)***	-0.4645 (0.0751)***
<i>asian</i>	0.1676 (0.0128)***	0.8002 (0.0944)***	0.1548 (0.0109)***
<i>black</i>	0.0418 (0.0111)***	0.1346 (0.0421)***	0.0361 (0.0108)***
<i>hispanic</i>	-0.0031 (0.0164)	-0.0260 (0.0533)	-0.0074 (0.0152)
<i>other</i>	-0.0740 (0.0301)**	-0.5037 (0.1075)***	-0.1672 (0.0401)***
<i>married</i>	0.0712 (0.0127)***	0.2075 (0.0396)***	0.0616 (0.0124)***
<i>masters</i>	0.0530 (0.0070)***	0.2000 (0.0290)***	0.0543 (0.0076)***
<i>postmasters</i>	0.0000 (0.0000)		
<i>JPMEph1</i>	0.1872 (0.0071)***		
<i>JPMEph2</i>	0.1400 (0.0079)***		
<i>OCS</i>	0.0039 (0.0100)	-0.0072 (0.0388)	-0.0020 (0.0109)
<i>othercomm</i>	0.1934 (0.0153)***	0.7336 (0.0875)***	0.1476 (0.0113)***
<i>command</i>	0.1932 (0.0052)***	1.4666 (0.0889)***	0.2337 (0.0055)***
<i>lpay</i>	0.0129 (0.0012)***	0.0400 (0.0035)***	0.0112 (0.0010)***
<i>y2005</i>	-0.0050 (0.0210)	-0.0180 (0.0813)	-0.0051 (0.0231)
<i>y2004</i>	-0.0072 (0.0210)	-0.0258 (0.0813)	-0.0073 (0.0233)
<i>y2003</i>	-0.0102 (0.0210)	-0.0382 (0.0813)	-0.0109 (0.0235)
<i>y2002</i>	-0.0124 (0.0210)	-0.0493 (0.0813)	-0.0141 (0.0237)

y2001	-0.0123 (0.0211)	-0.0504 (0.0813)	-0.0144 (0.0237)
y2000	-0.0124 (0.0210)	-0.0503 (0.0814)	-0.0144 (0.0237)
y1999	-0.0128 (0.0210)	-0.0550 (0.0813)	-0.0158 (0.0238)
y1998	-0.0143 (0.0211)	-0.0638 (0.0812)	-0.0183 (0.0239)
y1997	-0.0137 (0.0211)	-0.0622 (0.0812)	-0.0179 (0.0238)
y1996	0.0088 (0.0213)	0.0068 (0.0809)	0.0019 (0.0226)
y1995	-0.0121 (0.0211)	-0.0573 (0.0811)	-0.0164 (0.0237)
y1994	-0.0107 (0.0212)	-0.0529 (0.0811)	-0.0151 (0.0237)
y1993	-0.0106 (0.0212)	-0.0542 (0.0811)	-0.0155 (0.0237)
y1992	-0.0013 (0.0214)	-0.0227 (0.0808)	-0.0064 (0.0231)
y1991	0.0167 (0.0216)	0.0368 (0.0808)	0.0102 (0.0221)
y1990	0.0358 (0.0220)	0.1031 (0.0813)	0.0278 (0.0210)
y1989	0.0449 (0.0222)**	0.1305 (0.0816)	0.0348 (0.0206)*
y1988	0.0545 (0.0223)**	0.1626 (0.0821)**	0.0428 (0.0202)**
y1987	0.0607 (0.0224)***	0.1813 (0.0824)**	0.0473 (0.0199)**
Constant	0.5250 (0.0522)***	0.0752 (0.1923)	
Observations	13720	12920	12920
R-squared	0.11		
Notes: Standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%			

APPENDIX E. PAY ELASTICITY REGRESSION MODELS FOR TIER-3 PERFORMERS

Variables	(1) LPM, Robust SE	(2) Probit Model	(3) Partial Effects from Probit Model
Dependent Variable	<i>retention13yr</i>	<i>retention13yr</i>	<i>retention13yr</i>
<i>age</i>	-0.0800 (0.0076)***	-0.6667 (0.0624)***	-0.1589 (0.0133)***
<i>dependents</i>	0.0795 (0.0136)***	0.5490 (0.0704)***	0.1308 (0.0172)***
<i>prienlist</i>	0.3057 (0.0411)***	2.1961 (0.3257)***	0.7252 (0.0769)***
<i>female</i>	-0.2017 (0.0224)***		
<i>amerindian</i>	0.0000 (0.0000)		
<i>asian</i>	-0.4240 (0.0426)***		
<i>black</i>	0.2317 (0.0402)***	1.1229 (0.1730)***	0.3530 (0.0603)***
<i>hispanic</i>	-0.4347 (0.0467)***		
<i>other</i>	0.2343 (0.0515)***	1.0010 (0.3316)***	0.3323 (0.1292)**
<i>married</i>	-0.0273 (0.0252)	-0.4914 (0.1384)***	-0.1299 (0.0397)***
<i>masters</i>	0.5583 (0.0506)***		
<i>postmasters</i>	0.0000 (0.0000)		
<i>JPMEph1</i>	0.0000 (0.0000)		
<i>JPMEph2</i>	0.0000 (0.0000)		
<i>OCS</i>	0.2084 (0.0344)***	1.4587 (0.2281)***	0.4675 (0.0797)***
<i>othercomm</i>	0.6003 (0.0510)***		
<i>command</i>	0.0000 (0.0000)		
<i>lpay</i>	0.0158 (0.0018)***	0.0988 (0.0134)***	0.0236 (0.0030)***
<i>y2005</i>	-0.0118 (0.0637)	-0.0901 (0.3339)	-0.0206 (0.0730)
<i>y2004</i>	-0.0139 (0.0633)	-0.0471 (0.3338)	-0.0110 (0.0761)
<i>y2003</i>	-0.0282 (0.0637)	-0.1438 (0.3342)	-0.0320 (0.0693)
<i>y2002</i>	-0.0301 (0.0632)	-0.1960 (0.3355)	-0.0426 (0.0658)

y2001	-0.0470 (0.0634)	-0.1735 (0.3342)	-0.0381 (0.0672)
y2000	-0.0315 (0.0621)	-0.1289 (0.3368)	-0.0289 (0.0709)
y1999	-0.0247 (0.0620)	-0.1194 (0.3379)	-0.0269 (0.0718)
y1998	-0.0067 (0.0627)	-0.0484 (0.3397)	-0.0113 (0.0774)
y1997	-0.0035 (0.0629)	-0.0539 (0.3384)	-0.0125 (0.0767)
y1996	-0.0030 (0.0636)	-0.0423 (0.3327)	-0.0099 (0.0762)
y1995	-0.0326 (0.0647)	-0.1562 (0.3307)	-0.0346 (0.0677)
y1994	-0.0290 (0.0644)	-0.1072 (0.3327)	-0.0243 (0.0716)
y1993	-0.0358 (0.0647)	-0.1407 (0.3306)	-0.0314 (0.0687)
y1992	-0.0350 (0.0646)	-0.1475 (0.3302)	-0.0328 (0.0682)
y1991	-0.0379 (0.0646)	-0.1421 (0.3294)	-0.0317 (0.0684)
y1990	-0.0289 (0.0636)	-0.0300 (0.3301)	-0.0071 (0.0765)
y1989	-0.0175 (0.0629)	0.0285 (0.3306)	0.0069 (0.0808)
y1988	0.0005 (0.0637)	0.1742 (0.3275)	0.0448 (0.0903)
y1987	0.0051 (0.0635)	0.1795 (0.3287)	0.0463 (0.0910)
Constant	1.8263 (0.1788)***	12.7602 (1.3695)***	
Observations	1220	940	940
R-squared	0.36		
Notes: Standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%			

APPENDIX F. 13-YEAR RETENTION OPTIMIZATION MODEL

CURRENT Bonus Payment Structure				
Payment Year	Time (in Yrs)	Payment	PV	Discount Rate
LCDR+2	0	\$22,000.00	\$22,000.00	7%
LCDR+3	1	\$12,000.00	\$11,214.95	
LCDR+4	2	\$12,000.00	\$10,481.26	
		\$46,000.00	\$43,696.22	

CURRENT Situation				
Pr(Tier)	Total (at LCDR)	13 Yr Ret	Total (at 13 Yr)	Budget PV of Cost
Tier 1	0.3516	89	0.8452	75 \$3,277,216.35
Tier 2	0.5973	151	0.7714	116 \$5,068,761.29
Tier 3	0.0511	13	0.3319	4 \$174,784.87
		252	195	\$8,520,762.51

Base Retention Probabilities		
Base Case		
Tier 1	Pr(Tier1)	0.8452
Tier 2	Pr(Tier2)	0.7714
Tier 3	Pr(Tier3)	0.3319
		Adj for PE
		0.9101
		0.7417
		0.0000

Pay Elasticities (PE)		
Tier 1	ET1	0.0155
Tier 2	ET2	0.0112
Tier 3	ET3	0.0236

DECISION VARIABLES:

Bonus Payment to Tier 1 (P1) =

Bonus Payment to Tier 2 (P2) =

Bonus Payment to Tier 3 (P3) =

Tier 1 Performers (Tier1) =

Tier 2 Performers (Tier2) =

Tier 3 Performers (Tier3) =

Total LCDR Taking Bonus: 193

\$45,526.17

\$42,538.34

\$37,550.97

81

112

0

OBJECTIVE FUNCTION:				
Total LCDR Retention 193				

CONSTRAINTS:

Money (\$)	Budget	P1	Bonus Hier 1	Bonus Hier 2
	\$8,451,913.84	\$45,526.17	2988	4987
	≤	≥	≥	≥
	\$8,520,762.51	\$43,696.22	0	0

Retention Probabilities	Ret Pr(Tier1)	Ret Pr(Tier2)	Ret Pr(Tier3)	Ret Pr(Tier1)	Ret Pr(Tier2)	Ret Pr(Tier3)
	0.9101	0.7417	0.0000	0.9101	0.7417	0.0000
	≤	≤	≤	≥	≥	≥
	1	1	1	0	0	0

Personnel	Tier1 Pool	Tier2 Pool	Tier3 Pool	Tier1 Definition	Tier2 Definition	Tier3 Definition
	81	112	0	81	112	0
	≤	≤	≤	=	=	=
	89	151	13	81	112	0

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APPENDIX G. BONUS DIFFERENTIAL OPTIMIZATION MODEL

CURRENT Bonus Payment Structure				
Payment Year	Time (Yrs)	Payment	PV	Discount Rate
LCDR+2	0	\$22,000.00	\$22,000.00	7%
LCDR+3	1	\$12,000.00	\$11,214.95	
LCDR+4	2	\$12,000.00	\$10,481.26	
		\$46,000.00	\$43,696.22	

CURRENT Situation				
Pr(Tier)	Total (at LCDR)	13 Yr Ret	Total (at 13 Yr)	Budget PV of Cost
Tier 1	0.3516	89	0.8452	75 \$3,277,216.35
Tier 2	0.5973	151	0.7714	116 \$5,068,761.29
Tier 3	0.0511	13	0.3319	4 \$174,784.87
		252	195	\$8,520,762.51

Base Retention Probabilities				
Base Case			Adj for PE	
Tier 1	Pr(Tier1)	0.8452	1.0000	
Tier 2	Pr(Tier2)	0.7714	0.6887	
Tier 3	Pr(Tier3)	0.3319	0.0000	

Pay Elasticities (PE)		
Tier 1	£T1	0.0155
Tier 2	£T2	0.0112
Tier 3	£T3	0.0236

DECISION VARIABLES:

Bonus Payment to Tier 1 (P1) =

Bonus Payment to Tier 2 (P2) =

Bonus Payment to Tier 3 (P3) =

Tier 1 Performers (Tier1) =

Tier 2 Performers (Tier2) =

Tier 3 Performers (Tier3) =

Total LCDR Taking Bonus: 193

OBJECTIVE FUNCTION:

Tier 1 & 2 Bonus Δ \$18,098.08

CONSTRAINTS:

Money (\$)	Budget	P1	Bonus Hier 1	Bonus Hier 2
	\$8,486,378.16	\$48,060.20	7589	2920
	≤	≥	≥	≥
	\$8,520,762.51	\$43,696.22	0	0

Retention Probabilities	Ret Pr(Tier1)	Ret Pr(Tier2)	Ret Pr(Tier3)	Ret Pr(Tier1)	Ret Pr(Tier2)	Ret Pr(Tier3)
	1.0000	0.6887	0.0000	1.0000	0.6887	0.0000
	≤	≤	≤	≥	≥	≥
	1	1	1	0	0	0

Personnel	Tier1 Pool	Tier2 Pool	Tier3 Pool	Tier1 Definition	Tier2 Definition	Tier3 Definition	Retention
	89	104	0	89	104	0	193
	≤	≤	≤	=	=	=	≥
	89	151	13	89	104	0	193

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